FOOD INDUSTRIES

THE NEWS OF • PRODUCTION • ENGINEERING • DISTRIBUTION

BAKERY PRODUCTS

BEVERAGES

CANNED AND PRESERVED FOODS

CONFECTIONERY AND CHOCOLATE

DAIRY PRODUCTS AND ICE CREAM

FATS AND OILS

FLOUR AND CEREAL PRODUCTS

MEATS AND MEAT PRODUCTS

OTHER FOODS AND SPECIALTIES

DROUGHT EFFECTS DEMAND STUDY

Economic planning, such as we have it today, has run smack up against a superior force that overwhelms the efforts of men to order their affairs — a drought.

Manufacturing schedules, plans and commitments on the basis of normal 1934 crop conditions (under A.A.A. restrictions) in the Mid-West are facing a possible necessity for marked revision.

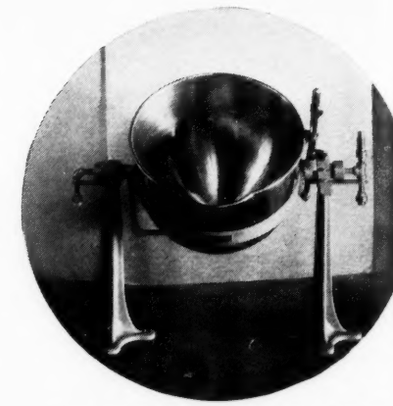
Supplies of available raw materials and prices may change seriously by midsummer. Purchasing power in stricken areas may evaporate.

Though not yet alarming, the situation calls for intensive study.

JUNE 1934

McGRAW-HILL PUBLISHING COMPANY, INC.

150 *Nickel Kettles for the "57 Varieties"*



Close-up photo showing trunnion type of 50-gal. steam jacketed Nickel kettle with Inconel top skirt. Five of this type installed in plant of H. J. Heinz Co. Manufactured by Lee Metal Products Co., Philipsburg, Pennsylvania.

Photo showing an installation of eight 250-gallon solid Nickel steam jacketed kettles in the plant of the H. J. Heinz Company. This company has more than 150 Nickel kettles in its plant, including 107 kettles of 250 gal. capacity. Fabricated by Lee Metal Products Company, Philipsburg, Pennsylvania.

One of the 250 gallon Pure Nickel steam jacketed kettles fabricated by Lee Metal Products Co., Philipsburg, Pa., for the H. J. Heinz Co., Pittsburgh, Pa.

And now 8 more durable NICKEL *units are installed in one of Heinz plants by Lee Metal Products Company*

YOU don't have to be told that equipment is best for the purpose, when it's selected by Heinz.

But to a food industry man it is interesting to know *why* Heinz selects it:

Heinz uses pure Nickel for these 150 steam jacketed kettles because it has higher heat conductivity than any other metal of comparable strength and corrosion resistance.

Only Nickel Has This Unique Combination of Properties

It may be possible to find a metal to equal Nickel's heat-transference efficiency...or its resistance to corrosion of food products...or its tough strength. But it is *not* possible to find a metal that *combines all three of these properties.*

Nickel's corrosion resistance protects the purity, taste and color of the foodstuff.

And its bright surfaces are rapidly and easily cleaned. Alkaline or abrasive cleansers do them no harm.

These bright surfaces always present an attractive appearance to plant visitors and inspire the pride of operatives.

Long Life...Low Maintenance

Nickel's steel-like strength resists wear, frees the equipment from repairs and gives it a life span of indefinite service at low maintenance cost.

Reasons enough-and-to-spare for Heinz—and other famous food manufacturers—to insist on Nickel. Let us send you the names and addresses of fabricators of steam jacketed Nickel Kettles and other Nickel food processing equipment. Just drop us a line.

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Monel Metal Household Appliances
at A Century of Progress, Chicago—1934
Home Planning Hall

INCO NICKEL **NICKEL**

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NRA WE DO OUR PART

THIS MONTH

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FOOD INDUSTRIES

NEWS OF PRODUCTION • ENGINEERING • DISTRIBUTION

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Copyright, 1934, by McGraw-Hill Publishing Co., Inc.

Contents indexed monthly in the Industrial Arts Index

FOOD INDUSTRIES. Published monthly; price 25c. a copy. Subscription rates: United States, Mexico and Central and South American countries, $2 a year. Canada, including duty, $2.50 a year. All other countries, $3 a year or 12 shillings. Entered as second-class matter April 30, 1929 at Post Office at New York, N. Y., under the act of March 3, 1879. Printed in U. S. A. Cable address: "McGrawhill, New York." Member of A.B.P. Member of A.B.C.

McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N. Y.

Branch Offices: 520 North Michigan Ave., Chicago; 883 Mission St., San Francisco; Aldwych House, Aldwych, London, W. C. 2; Washington; Philadelphia; Cleveland; Detroit; St. Louis; Boston; Greenville, S. C.
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FOOD INDUSTRIES

THE NEWS OF • PRODUCTION • ENGINEERING • DISTRIBUTION

Established 1928—McGraw-Hill Publishing Company, Inc.
Volume 6 Number 6

New York, June, 1934 . . . Laurence V. Burton, Editor

Drought and Your Business

UNFAVORABLE weather over extensive areas may not always affect your job but it cannot avoid having some sort of effect on your business through the medium of changes in quality, quantity and prices of raw materials or through direct or intercommodity competition of manufactured goods.

◐ Through the widespread advertising of the drought in the Middle West by the vast dust cloud that blanketed whole States, the magnitude of the drought has been forcefully set forth. Current weather phenomena, which may or may not be associated with low solar constant of radiation, affects all business, including the food business.

◐ It would be ludicrous were it not tragic to note the consideration of a reversal of crop curtailment policy by A.A.A. At a time when every effort is bent on curtailment it suddenly becomes necessary to plan for relief of those afflicted areas where drought has unexpectedly overdone curtailment.

◐ Uncontrollable forces of nature, surpassing all the forces under the command of man, will always be able to scatter our best laid plans as dust before a whirlwind.

◐ To the plant employee such problems of geography on a national scale may appear of but casual interest. But to management a correct appraisal of a sudden turn of events is vital.

◐ Reports of the extent of the crop damage are still fragmentary and, while the damage itself may yet be considerably relieved by adequate rainfall, the hazy picture of the future is taking shape on the following lines:

◐ On the side of wheat the current estimates are that there will be a minimum safe carry-over into 1935 of two hundred million bushels, subject to possible further downward revision. Unfavorable geographic location of wheat supplies makes it possible that later in the year the Pacific Northwest may be exporting forty million bushels simultaneously with importations from Canada into the Northwest spring-wheat district. Unconfirmed estimates state that Kansas will have little left of its earlier predicted sixty-million-bushel export wheat surplus.

● The future of the durum wheat crop is subject to rather calamitous speculation. One lugubrious report is that very little durum wheat will be available—that the dust cloud was really the durum wheat fields blowing away. (Important, if true.)

◐ Of corn there will be plenty, due to the loans on corn in sealed cribs.

◐ Peas for canning in the upper Middle West are in a critical condition, but can be saved by rain. Quality seems likely to be injured. Pasturage in this area will suffer or be improved by the same forces, and thus exert its influence on the milk supply. Government plans call for purchase of cattle from stricken areas.

As It Looks To Us

Decisions Go Far . . .

Strange things happen as a result of economic decisions and forces. The use tax on coconut oil from the Philippines, a tariff in disguise, may reestablish the whaling industry.

Americans do not eat copra, nor do they consume whale oil, yet this tax may indirectly affect many a food plant. The effect may be felt as far away as the meat packer who is waiting to buy a new conveyor until the increase in the price of recoverable inedible grease that is now lost makes its value equal the interest in the investment.

New Food Law . . .

As a matter of practical politics we are veering to the opinion that the food industries would be better off if the revision of the food and drug law were enacted this summer than to take a chance of what may happen next year. We carefully avoid saying anything about other industries that are subject to its jurisdiction. Undoubtedly others will be no worse off by postponement of enactment.

What would be the attitude of a Congress reelected on a "New Deal" ticket? The *Literary Digest* poll of public opinion should give pause to all who counsel delay.

Sec. 7(f), requiring declaration of ingredients in order of predominance by weight, is still in the bill and should be deleted despite the revision of Sec. 25 (Food Industries, April 1934, page 154).

New Packing-House Byproduct . . .

A new outlet for animal fat has been developed by Armour & Co., after a very considerable research, and it also affords farmers a better way to utilize skim milk on the farm. The idea is to feed the fat to calves as a milk supplement in the form of a homogenized product called "Vita-Fat." Thus the farmer may skim the butter fat from his milk, replace it by other animal fats of cheaper cost and value, and feed it to produce better calves than before.

The most interesting feature of the research is the discovery that calves cannot drink milk properly from a pail. Their physiology and anatomy is such that, when drinking, the milk goes into the rumen, or paunch, instead of passing into the fourth, or true, stomach. However, when the calf sucks milk instead of drinks, the milk goes to the right place and digests properly instead of souring in the rumen. Hence a pail with a rubber nipple extending horizontally at the bottom is employed for calf feeding. The "Vita-Fat" contains 55 per cent of fat and adequate quantities of vitamins A and B. Here is a splendid example of the results of research to produce higher value products in an industry which has been suffering from low prices.

Unemployment Insurance . . .

Everyone is interested in unemployment insurance. Fear of losing one's job has haunted everyone at some time in his life. But somehow the legislative proposals for compulsory unemployment insurance for everybody appear to be more idealistic than practical.

Until it is possible to guarantee the continued existence of a business enterprise, it will not be possible to insure against possible unemployment of all its workers. Insurance against short layoffs may be possible, but the real problem of the unemployed worker arises from long shutdowns. From what sort of corporate insurance reserves could the money have come to carry the unemployed during the years from 1930 on?

Nothing could be more cruel than to promise workers that they need not save against the rainy day and then to default. When it is possible to guarantee the continuity of the employing company, only then is there a chance to guarantee the continuity of the income of the workers. While the proposals do not insure against unemployment by guaranteeing jobs, the problems are so inexplicably intertwined that one seems to be impossible without the other.

Economic Security . . .

In our meditations on unemployment insurance, we reach the conclusion that to own one's home comes pretty close to a practical substitute for unemployment insurance. And when we say own it, we don't mean a house that is plastered with mortgages of the first, second or third variety. We mean a home which is free of encumbrances.

In many localities, prior to 1929 it was customary to purchase a home the cost of which was far beyond the buyers' capacity to pay. A debt for a home equivalent to three or four times one's annual income from all sources is extremely difficult to pay off. A debt for a home that is five or six times one's annual income is impossible to pay off. The maximum safe price is two times one's annual income, but when one buys a place that costs only one year's income it is comparatively easy to pay off. Yet it is surprising how long even this modest obligation will require for its complete discharge.

Problem . . .

One inquiry from readers which recurs more frequently than any other is the question of what is the most profitable, or least expensive, method of utilizing orange peel.

Everyone recognizes that there is a certain quantity of orange oil contained in the peel. But after the desired quantity of such oil has been obtained, then comes the problem of what to do with the rest of the peels.

Is it purely refuse?

Compensatory Taxes . . .

Processing taxes afford plenty of interesting problems to the processors, but the real fun occurs when a compensatory processing tax is slapped onto a product and the producers are wholly unsuspecting of its imminence. Paper-bag manufacturers were recently called upon to pay a tax on floor stocks and begin to pay a compensatory tax to the Department of Agriculture—all for the benefit of the cotton growers who

have signed up for cotton acreage reduction.

Thus the cotton-processing tax comes right back to the food manufacturers who buy or sell foodstuffs in paper bags. For example, flour bags of from 5-lb. to 24-lb. capacity carry a compensatory tax equal to 14-25 per cent of the total selling price, depending on the size and type of paper used. Irrespective of whether the user of the paper bags (or jute bags, for that matter) ever used cotton, a compensatory tax must be paid.

The tax extends into all manner of industries where bags are used, such as chemicals, tankage, cement, kalsomine, as well as sugar, salt, flour. In these cases the compensatory tax is purely a question of business economics. But when it hits the farmer of the North who is taxed for the benefit of the farmer of the South, it becomes a political issue as well.

Only the Facts . . .

Lest any of our readers become infuriated at the results of the survey entitled "What Price Codes?" printed in this issue, may we state that Mr. Fitzgerald was requested to get the facts as they existed. His personal views, as well as ours, have been rigidly excluded.

Paging Mr. Hitler . . .

Germany has seen fit to exclude our big brother, *Chemical and Metallurgical Engineering,* on the ground that *Chem. & Met.* has spoken disrespectfully of Adolph Hitler.

People who strut and take themselves very seriously always tickle our funny bone. We would be sassy, too, if we could think of anything to be sassy about.

What we don't like about Mr. Hitler is the burden he imposes on the editors of FOOD INDUSTRIES by compelling us to listen to the tales of woe of German refugees, just off the boat, each one of whom seems to be imbued with the high purpose of going into the food manufacturing business in the United States.

All who have called on us up to now have transported with them about a half ton of a trick chemical preservative—harmless, so they say, and allegedly approved in Germany. Of course, these are all of secret composition and so we cannot assist them in any way or even advise them properly. Our uniform procedure is to pass them on to the Federal Food and Drug Inspection Service and warn them to keep no secrets from it.

As for these refugees, Mr. Hitler —these refugees who come bearing trick chemicals—we wish you would divert them to some other country. Otherwise "You ain't heard nuthin yet".

Peeling . . .

Removal of skins of vegetables can be accomplished by hand labor or by machine. The relative economy of the methods depends on more than the cost and skill of hand labor and the cost of the vegetables. As a rule, mechanical peeling is the more satisfactory all around, because its rapidity eliminates the need of anticipating one's requirements of peeled produce by a half hour or more. To force a production line to wait while hand-peeling is done is pure unalloyed waste and the cost of the delay is chargeable to the peeling operation.

Machine waste must be controlled, however, for the operation continues as long as anything is in the machine and the power is turned on. Grading vegetables for size helps to control the waste. When the different sizes are run separately, the amount of waste can be reduced to as low as ten or fifteen per cent of the input, whereas running both large and small sizes together may double the waste through excessive peeling of the smaller vegetables.

Congratulations . . .

National Canners' Association has established a statistical department under the direction of Carlos Campbell, an able economist until recently with the Bureau of Agricultural Economics. Canners of the country will profit greatly by this far-sighted action. They are to be congratulated. Other industries will do well to imitate their plans and to find equally able leadership.

Three material benefits can be gained from the effective use of statistical information of this sort. Mr. Campbell is organizing his plans for N.C.A. to meet all three needs as fully as possible. The facts gathered will permit intelligent marketing practices, thus preventing the uninformed of the industry from needless price-cutting, a practice of the past based as often on ignorance as on intent. The facts will, in the second place, facilitate plans for marketing canned goods in competition with other food materials; and inter-food competition these days is just as important as inter-company competition. Thirdly, the industry as a whole will be protected against certain ruthless buying practices, indulged in occasionally by the less scrupulous of the merchandising groups.

Each division of the food industries should today be guided by facts. Many divisions are inadequately so equipped. More should prepare themselves as the National Canners' Association is doing.

Onazote . . .

An insulating material of unusual character and properties was described at the last annual meeting of the American Society of Refrigerating Engineers by Harry D. Edwards, of Union Carbide Company. It is made from rubber partially vulcanized under high pressure of nitrogen and is, therefore, a sort of nitrogen-filled sponge rubber; hence the name Onazote.

In addition to being very light, an excellent insulator (1.5 times the conductivity of still air), waterproof, verminproof, and odorless, it also can be formed into solids or granules, and when solid can be made either soft or rigid, molded, sawed, cut, or machined. In one form it is tongued and grooved plank for refrigerator-car insulation. Only one car has been thus insulated in this country, but it has been in use since 1928. It is said to be the only "reefer" that weighed less at the age of two years than when new. Onazote, an English development, may have a profound influence on the future of frozen-food distribution in the United States if it becomes commercially available.

Opportunity . . .

Scallop fishermen are looking for a profitable use for byproduct scallop "meat." The term meat represents what is left of this crustacean after the muscle, or "eye," has been cut out. About 12,000 gallons weekly could be made available if there was a demand. At present the "meat" is dumped overboard at sea.

Public hearings on codes are held only after months of committee work.

What Price Codes?

A Survey of Confidential Opinion In the Food Industries

By JOHN D. FITZGERALD
Milwaukee, Wis.

WITH N.R.A. now definitely on the spot, the coming months will tell the story of the code system for industry. What are business men saying, now that the bolder spirits are breaking the long silence relative to governmental affairs?

What has been the history of the actual working out of the few codes that have been approved? Are they accomplishing the purposes for which they were intended? Will code authorities continue to function or will they die of disuse?

Such are the questions facing management today. If codes are here to stay in their present form, management wants to know and know quickly. On the other hand, if they are to be modified or discarded, the business man would like to be able to make his plans accordingly.

To find the answer to these questions requires tapping the sources of public opinion, for it is the judgment of this fickle tribunal which will determine the future course of N.R.A. What is the truth regarding the whole code system?

Outside of publicity puffs emanating from Washington there has been very little public expression of opinion regarding the new order. A warlike spirit of patriotism gave the "New Deal" its chance to work without criticism or interference. Partisan criticism has been conspicuously silent until very recently. Congress has been friendly, even subservient.

Endless conferences, code revisions, innumerable trips to Washington, disappointments, vexatious delays, heated arguments, and compromises characterize the industrial history of the past year. And after much labor the mountain brought forth a mouse. A few codes for the food industries have actually been approved and signed.

Experience with these codes, all very recent, has found some manufacturers pleased. But more of them are more or less indifferent or unhappy and even aggrieved. Such a conclusion is inevitably reached by anyone who will take the time to observe carefully, interview widely and write voluminously. In further substantiation of this conclusion are the statements and recommendations made at the recent convention of the United States Chamber of Commerce. In general, codes of fair competition as they now exist are far from meeting unqualified approval. Critical, even hostile, opinions are becoming daily more articulate.

Recently I learned the story of a manufacturer who accepted his industry's code in good faith and endeavored to operate his business according to its specifications. In a short time is became apparent that he could not remain in business and operate under N.R.A. Consequently he wrote to the President saying he was going back to the old way, and if the administration did not approve, he would be perfectly willing to have the marines come after him. According to the last word I have, this manufacturer has received no answer.

Of much greater significance is the report that one company has withdrawn from all participation in code work on the ground that its executives are spending altogether too much time away from their jobs.

Realizing that manufacturers were still reticent about a frank discussion of the codes, I have relied to a large extent on confidential interviews to learn their real opinions. Protection against quotation and remarks not in writing are the surest way to break down the barriers. Obviously these qualitative observations had to be confirmed or modified by the quanti-

This survey by interviews and questionnaires was made at the request of FOOD INDUSTRIES.

tative method of questionnaire. The following remarks summarize the results of both investigations.

In certain respects there was almost a unanimity of opinion. In other respects there was quite a division of opinion. Without attempt at analyzing or coloring these opinions, I am setting down certain definite observations as reported to me.

How many codes directly affect a given business? The range of answers to this question was from 1 to 100. One manufacturer reported that one factory alone was affected by over 20 codes. The average for the total list contacted, which included the canning group, the carbonated beverage group, the baking industry group, the yeast group, the candy manufacturers group and the chocolate manufacturing group, ran somewhere between 15 and 20 codes. The number naturally increased with the multiplicity of products manufactured, particularly in instances where the concern had its own carton plant, printing presses and other supplementary manufacturing operations influenced by specific codes.

How many executives have been directly concerned in code work? In compiling an accurate answer to this query a great deal depends on the interpretation of the word *directly*. In almost every instance two and sometimes three major executives have been drafted for code work. In addition, sales and manufacturing department heads and managers have been called into special meetings pertaining to code developments. It is difficult to get an accurate check on these indirect requirements on code work, but consider for a moment a few further angles on the story of these two or three major executives. Investigation discloses that their code work has been going on for a nine-month period on the average. Most of the executives questioned trace the beginnings to late summer of 1933.

In an effort to get at the bottom of this time-requirement phase, one more questioned was advanced: *What would be a rough estimate on the per cent of the executive's business day represented on an average in this code work?* Here a great range of answers was uncovered. One large food company has brought in a lawyer from the outside, made him an officer of the company. He is spending full time on code work. This is in addition to the part-time service of several other leading executives of the company. In general, however, the range of executive time was from 7 per cent to 75 per cent; averaging about one-third of the business day for the past nine months.

Summarizing briefly the first phase of the investigation: it is apparent that the food industry has contributed a large number of business hours in the high-salaried brackets to the development of the industry codes—time that might have been spent in sales promotion, product development, or in the general conduct of the business. This is reflected also in the amount of evening work to which a number of these executives have fallen heir. It was pointed out to me that one of the officers of a baking company, who has been drawn rather heavily into code work, carries home a brief case of accumulated unfinished work nearly every evening.

What the future requirements upon industry in code work are to be is, of course, difficult to estimate. Certainly the enforcement stage, if properly carried out, does not suggest any letdown in code responsibility.

Other interesting sidelights on this subject should be considered before arriving at any fair conclusions. For example, advocates of the "New Deal" point to shorter hours and increased wages as two of the strong points of the code system. What have these food-product manufacturers to say on this subject? In general they have accepted these changes without serious grumblings. This is true in spite of the fact that labor costs among the manufacturers interviewed averaged 22 per cent of the total production costs. The main dispraise from these executives, on the other hand, was Sec. 7 (a), the collective bargaining, or labor, aspect, which has tended, it was declared, to undermine the friendly relationship between management and labor.

A Few Typical Experiences and Opinions Selected at Random From Large and Small Concerns

Company	How many codes affect your business?	How many executives are directly concerned in code work?	For how long a period (months)?	How many men and what per cent of business day now devoted to code work?	What per cent of total manufacturing cost is labor?	What is effect of codes on mechanization of plants?	What is effect of codes on manufacturing costs?	What is effect of codes on selling prices?	What is effect of codes on markets?	Remarks
										Can you obtain benefits commensurate with the efforts which will be necessary for enforcement?
A	47	10	10	1-100% 9-50	.....	Increase	Increase	Steadier	Slower	Depends on attitude of administration
B	15	7	10	3-50 4-10	20%	None	Increase	Increase	No change	Don't know; doubtful
C	2	1	9	1-53	23-30	Must Mechanize	Greatly Increased	Must get higher prices	No improvement	90 95% of manufacturers in our line working without profit due to unfair practices of chain stores
D	20	1	9	1-75	33	.....	25% Increase	Increase but cannot recover the increased costs	No effect	Codes are not workable
E	26	3	5	.....	17	Increase	28% Increase	Eventually much higher	Retarding improvement	Codes will be detrimental and enforcement difficult to this branch of industry except larger operators
F	1	1	1	1-5	24	Increase	Increase all costs	Bound to increase	Better, but not due to alphabetical obsession	Codes provide too rigid a framework for business to work in
G	12	1	10	1-10	9½	Increase	Not materially changed	Should not increase	Chiselers are in heyday	Codes are dying from laxity of enforcement
H	All I have heard of	0	0	0	30	.....	20% increase	Increase	Hard question	Trust so. *but* not sure.
	15	2	9	2-10	7	Stimulate	Not much change	Increase to offset increased cost of materials	Upset	We are for a code that is workable, but overhead is now too high to give public enough for its money Only advertised and well-established concerns will be able to benefit to a degree commensurate with effort
	2	2	6	.....	35	.....	25% increase	10-20% increase	Can't tell	We hope and will try to get the benefits

Costs Are Going Up

Then, too, there was another development of the code system which was quite generally deplored. In most instances, an increased volume of business over the same period of a year ago was reported. At the same time the increased price of raw materials, higher wage scales and increased taxes, particularly the processing

taxes, have greatly boosted production costs. Up to the present time they have not been able to pass on these additional costs to the consumer, which has meant a dwindling margin of profit. This, of course, may be only a temporary situation, as it is generally expected that a rise in consumer prices is to follow in the near future. The estimate on this expected rise in consumer prices is given as between 10 per cent and 20 per cent.

Another question of timely interest is *the effect of the codes on mechanization policies.* Here again there is quite an unanimity of opinion. Wherever possible, it is expected that production will be further speeded up. In some instances it is expected that new and up-to-date machinery will be brought in to replace obsolete or inefficient equipment. The history of the depression has shown about a 5 per cent speed-up of rate of production yearly, and it is expected that this figure will be increased under the new order. *But what about the N.R.A. and A.A.A. in relation to markets?* Here again the tenor of the remarks is negative, varying in intensity of feeling. There is very definitely a school of thought that maintains that these governmental agencies are retarding improvement. Admitting certain improvement in business, the feeling is that this has been accomplished in spite of rather than because of the codes. The exact words of one reputable manufacturer are: "Now the chiselers are in their heyday; fair merchants are suffering." Others have a more charitable attitude, preferring not to pass judgment until a later date.

Of course, all discussions lead finally to the question of the enforcement stage. With one exception, I discovered great pessisism and doubt as to the practicability of rigid code enforcement in a major way. The general feeling seemed to be that public opinion, which is the judge in the final analysis, was swinging away from the N.R.A. This being true, attempts at prosecution would make martyrs of these chiseling companies and their businesses would profit rather than suffer as a result of attempts at governmental enforcement.

The real meat of the investigation lies in the voluntary comments on these code questions. No attempt was made to set up a pattern for remarks and consequently they include a wide range of viewpoints on various phases of the various codes. Yet certain underlying convictions will be readily noted. In grouping these opinions I am taking the more critical school of thought first and then the more friendly, with the thought of leaving with the reader a properly balanced compromise viewpoint.

In the minds of large and small manufacturers a general opinion prevails that the codes will react in favor of the large, well-established, well-financed business as against the smaller business. The logical development of this idea, it is pointed out, will mean that it will be better for smaller manufacturers and their organizations in many cases to give up their struggle and seek positions with the larger concerns. Politically this is rather an interesting observation. The President, who had bitterly attacked the ways of big business in his campaign, it seems has unwittingly been a party to setting up the machinery for aiding big business in its struggles against smaller competition, which in order to survive had resorted to certain practices now outlawed under the "New Deal."

Industry representatives at a public code hearing are a mere handful compared to those who have participated in the preliminary work.

In answer in part to this point of view, one manufacturer maintains: "I think only advertised and well-established concerns will be able to benefit to a degree commensurate with the effort of code enforcement. There will still be many concerns left which do not justify their existence and the failure of which would be the normal and healthy solution for all." Perhaps a little heartless, yet it points clearly to an era of the survival of the fittest, with reputation and financial strength the major requisites of fitness.

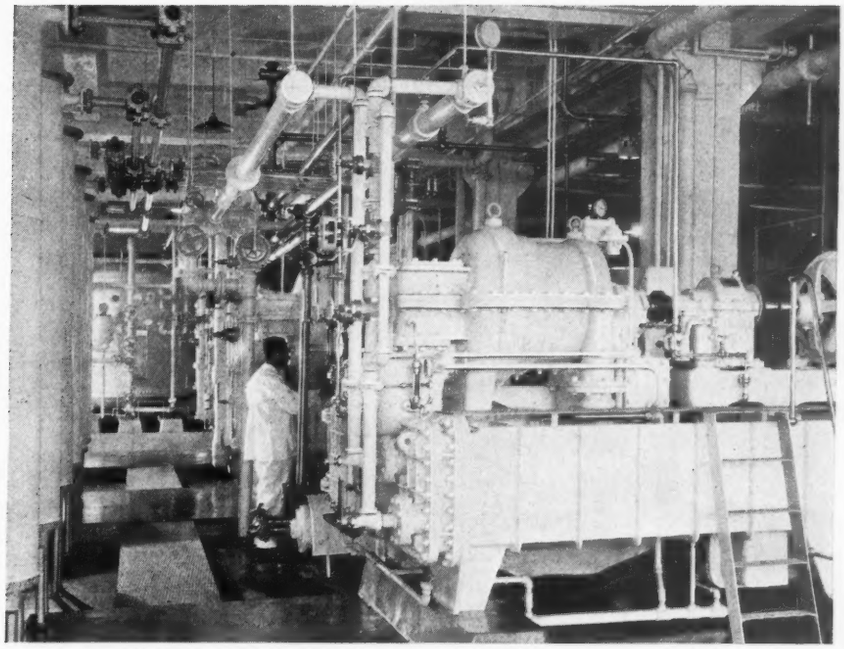
Profits Eliminated

Another manufacturer sees in the codes in their present form the elimination of necessary profits. "I cannot see," he says, "how the codes can help industry in the present form, except that the government guarantee the manufacturer a fair margin of profit on his manufactured articles, as we must guarantee wages to labor." He then goes on to predict the danger of the situation. "The very near future will tell if the retail industry can overcome the present crises. Between 90 per cent and 95 per cent of all retail manufacturers are working without profit. The entire retail trade is held in a state of anxiety and suspense." The conclusion from these remarks hits a note which is very generally on the manufacturer's as well as the retailer's mind.

Again, another manufacturer who has been very closely identified with code developments in Washington counters with the opinion that, after admitting a division of opinion on the advisability of codes, industry has gotten just about what it wanted. But, this same manufacturer goes on to say that he sees no hope for the N.R.A. as a permanent institution.

Such are the views on the N.R.A. of a cross-section of the food industry today. As one manufacturer cautioned, the rapid developments in our political and economic orders may readily change or alter opinions given but a short time before.

The verdict will in the final analysis be determined through political channels. An entire House and one-third of the Senate stand for reelection this fall. It will be for the voter, after he has weighed the report of the administration against the opinions of the opposition, to decide the future course of our political order.



Adequate refrigeration capacity is essential to carbonated beverage manufacture.

Problems in the Bottling of Carbonated Fruit-Juice Beverages

By J. H. TOULOUSE

Research Director
American Bottlers of Carbonated Beverages
Washington, D. C.

TWO general problems confront the bottler in the manufacture of carbonated beverages containing fruit juices. One relates to the standardization of the beverage and its cost, and is a problem for bottlers as a group. The other is concerned with his individual problems in the technique of bottling beverages containing fruit juices and the additional precautions that may be necessary to prevent spoilage. For the latter, the bottler must recognize the causes of biological and chemical changes that may take place.

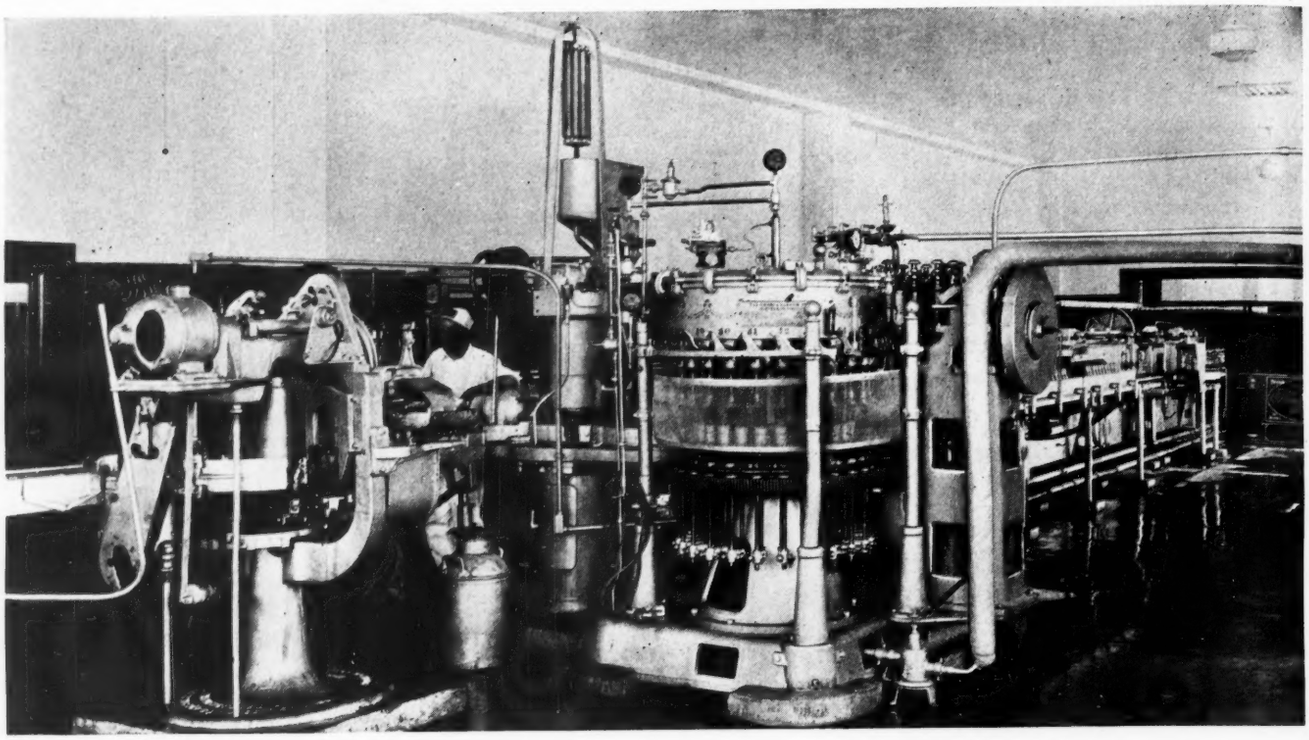
Standardization is necessary because no beverage will ever achieve importance on more than a local scale unless the consumer learns that he can always expect an undeviating quality and taste. The standard may need to vary slightly in certain sections of the country, as there exists a distinct geographical gradient in the preference for sweetness and acidity. The extent of variation of this gradient, in the case of sugar, is from 2 to 3 per cent by weight. The South desires sweeter beverages and New England more acid beverages than the Central West. Careless or injudicious bottlers disregard these limits, with the result that beverages of the same type may vary greatly in taste, even in the same geographical region. To achieve a quick and permanent consumer preference for his product the manufacturer of a fruit juice for bottlers' use should first standardize his own product and then demand adherence within very close limits to his formula on the part of the bottler.

The effect of the cost of the added fruit juice on the selling cost of the beverage itself is highly important. About 90 per cent of all carbonated beverages are made for a standard retail selling price of 5 cents per bottle. Of this sum, the portion represented by the cost of ingredients, which includes fruit juices, other flavors, sugar, citric acid, and color, has a comparatively well-defined maximum. For this reason, there may be an economic limit to the amount that can be expended for flavoring materials, regardless of the quantity of juice that can be successfully employed from the technical standpoint, if the selling price of 5 cents is to be maintained.

For the satisfactory use of fruit juices in carbonated beverages several changes in bottling technique are required. If pulp content is to be a feature of the beverage, proper distribution of the pulp must be secured by continuous agitation for the period during which the pulp-bearing syrup is being drawn off for bottling. Additional precautions must be taken in the cleansing of the bottling system to remove traces of unused pulp.

While beverages containing fruit juices contain valuable minerals desirable for human nutrition, these same minerals are of value also in bacteriological metabolism, and thus may bring about greater spoilage losses in manufactured goods. These minerals are chiefly potassium, phosphorus and sodium, with the addition of nitrogen,

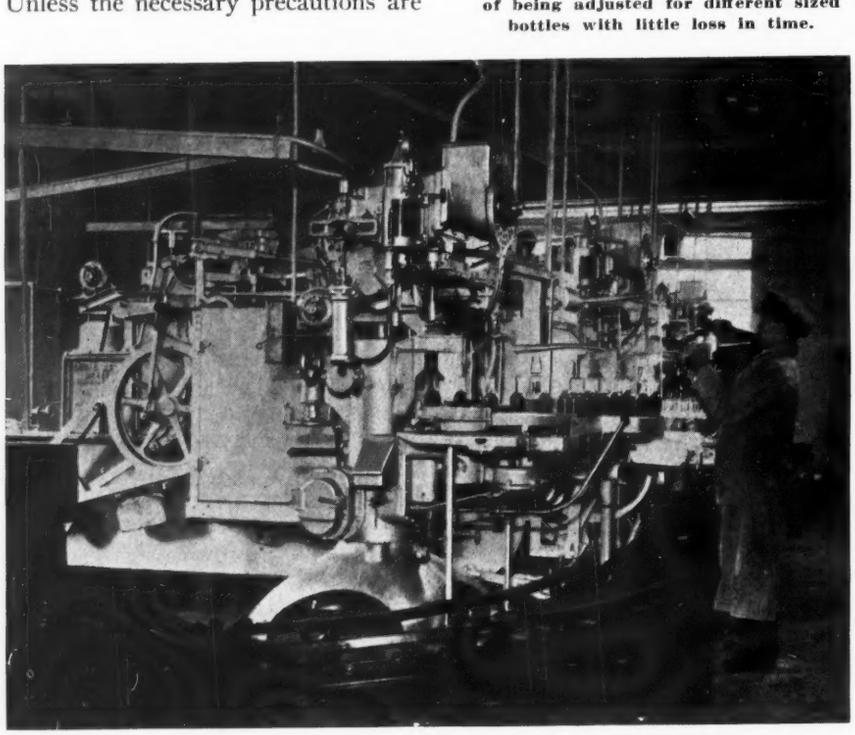
Composite abstract of two papers entitled "Citrous Juices From the Bottler's Standpoint" and "The Oxygen-Consuming Phenomena in Beverages," read before the Division of Agricultural and Food Chemistry, American Chemical Society meeting, St. Petersburg, Fla., March 27 and 28, 1934.



Careful attention to bottle-filling operations and use of first-class equipment will help prevent spoilage due to oxygen of the air.

not normally of importance in other carbonated beverages. With these factors to accelerate their growth, both yeast and bacteria may be able to develop more frequent and more rapid spoilage if the beverages become contaminated. As heat-treatment of the juices is highly undesirable and as the value of chemical preservatives is limited extraordinary sanitary measures may be demanded. Unless the necessary precautions are taken, spoilage and loss of salable goods may be greater with fruit-juice type of beverages.

Overhead costs can be kept low by use of small, compact units capable of being adjusted for different sized bottles with little loss in time.



These factors are not the only ones that the bottler must take into consideration. The method of storage of the fruit-juice concentrates or of the finished beverage made from them may affect the flavor adversely. Storage in a warm room is highly undesirable. Sunlight also is very destructive, as it will catalyze certain chemical reactions that are possible in the beverage. Sanitary handling of the juices and syrups is obligatory. Oxidations will ruin the flavor if certain oxidizing substances, such as free oxygen or chlorine, are present.

We have found that the oxygen content of the air which is retained in the sealed bottle of a carbonated beverage decreases rather rapidly, with an accelerated rate in beverages containing juices or flavoring substances entirely derived from natural sources, such as the citrus juices and oils, and various barks, beans, roots and berries. Microorganisms also utilize the oxygen, and in most cases when yeast or bacteria have been growing in the beverage for a sufficient time, the oxygen will be found to have almost completely disappeared. To eliminate such cases in the study of the oxygen-consuming power of the beverage, each sample analyzed gaseometrically was plated on nutrient and wort agar, and the

centrifuged sediment from the beverage examined for the presence of microorganisms or evidence of their growth. All cases involving the growth of bacteria, yeasts, or molds were eliminated from consideration.

Oxygen Absorption Varies

Not only was it found that oxygen disappeared from the beverage in the absence of microorganisms but that the disappearance varied somewhat according to the flavoring class. Two general classes of flavoring materials exhibited the oxygen-consuming phenomenon to a considerable extent. One of these was the group of citrus-juice beverages which contained from 5 to 10 per cent of juice by volume. Another was the class of beverages made from extracts of natural sources, and included the citrus oils (unmodified) and extracts of other plant materials such as are used for vanilla soda, root and birch beer, sarsaparilla, grape soda made with a grape-juice base, and similar beverages. It also included ginger flavors, although it was found that ginger extract was very little affected by oxygen, probably because many manufacturers allow their ginger extracts to blend or age for considerable periods.

In another group of flavors was placed all those that are commonly made with artificial fortification. These did not absorb oxygen to any great extent, and were very little affected in taste. Deterpenated citrus oils were found to be in this group.

An explanation is to be found in the unsaturated constituents of the flavoring compound. In the case of the citrus juices particularly there may be cited the presence of terpenes and sesquiterpenes, as well as aldehydes, alcohols, ketones and the like, which are easily oxidized. The terpenes, although they contribute very little to the actual flavor of either the fresh juice or the extract made from citrus oils, are capable of being easily oxidized to highly flavored substances, which cause a bitter or rancid taste in the beverage. Other compounds are greatly changed in the character of their taste by oxidation. All of these changes due to the action of oxygen have been studied by investigators in this field and apparatus has been developed for the protection of juice in storage and manufacture, but no great attention has yet been paid to the problem of oxidation in the finished beverage.

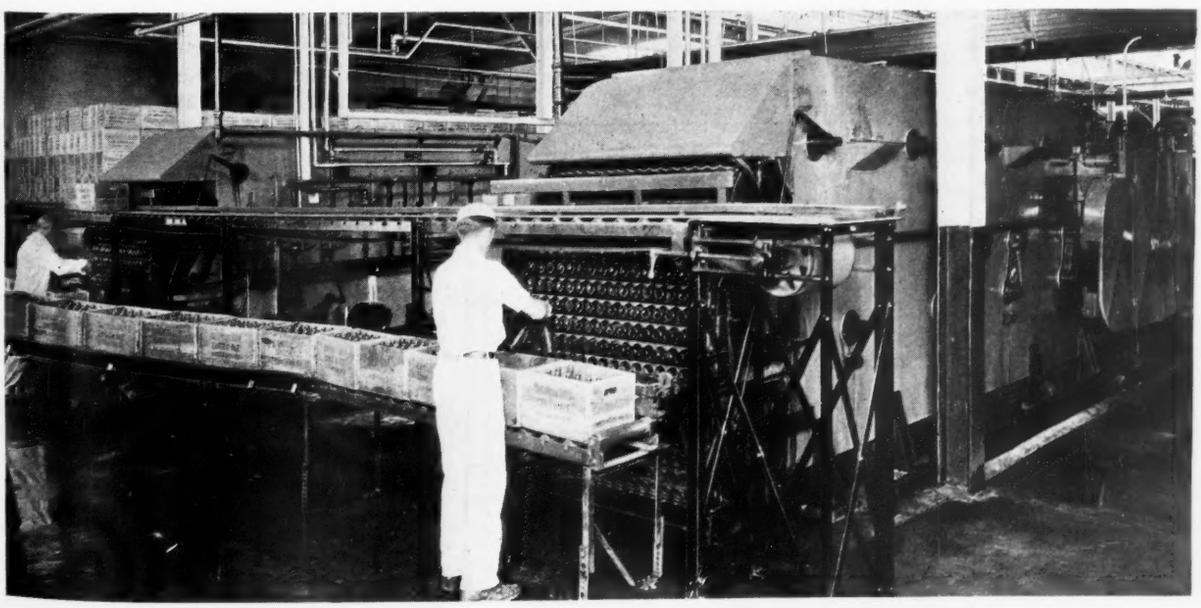
Air a Source of Trouble

It is important to recognize the sources of the oxygen and any other oxidants that might gain access to the beverage. In the bottling process as normally carried out, there is no need of agitating the syrup, but in the case of syrups containing pulp, agitation must be carried out during the entire time that the syrup is being drawn off to the bottles. Improper agitation will incorporate a considerable quantity of air in the syrup, which may even appear milky white because of a suspension of air bubbles. Such a condition will considerably increase the air content of the beverage.

Although the actual bottling machinery is designed to remove most of the atmospheric air from the empty bottle during the filling process, faulty operation or worn-out equipment will allow an increase in the quantity of residual air. Analysis of the top gas from several hundred bottles indicates that the air content will be almost never less than 3 to 5 per cent of the total gases in the head space of the bottle, while in many cases it may be as much as 50 per cent of the total gas. While improvement in machine design may help to some extent, attention to operating conditions and elimination of obsolete equipment will bring about the greatest benefit.

Other Oxidizing Agents

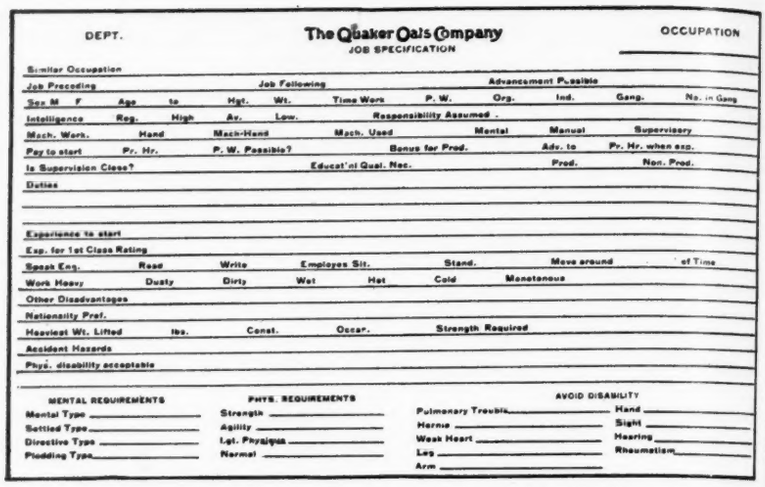
Certain precautions are needed because beverages containing fruit juices may be unusually susceptible to the action of other oxidizing agents such as chlorine or chlorinated compounds in water. A very serious change of flavor occurred when the water in one locality contained from 50 to 100 parts per billion of chlorinated cresol. In this instance a beverage containing 5 per cent fruit juice was the only beverage affected, either in the bottling plant making it, or in other bottling plants using the same water. The difficulty was remedied by treating the water with activated carbon. Excess chlorine from the sterilization of bottling machinery or from the use of a heavily chlorinated rinse water in the washed bottles may be another source of this type of spoilage.



Careless use of chlorine in bottle sterilization and rinsing may be an indirect cause of spoilage of fruit-juice beverages.

ACCIDENTS should be prevented for humane reasons. But there are other considerations. They cause lost time, disrupt production and often damage equipment.

BY PROPER PRECAUTIONS in selecting and training personnel, Cedar Rapids Mill of Quaker Oats Co. curtailed accidents until the rate was only 0.11 day of lost time per 1,000 man-hours in 1932. The rate was 1.15 for the entire food industry (total 1933 accident experience of the food industry was not available). The company also made an excellent record in accident severity in 1930 and 1931.



DEPT. — The Quaker Oats Company, JOB SPECIFICATION — OCCUPATION

Similar Occupation

Job Preceding — Job Following — Advancement Possible

Sex M F | Age to | Hgt. | Wt. | Time Work | P. W. | Org. | Ind. | Gang. | No. in Gang

Intelligence | Reg. | High | Av. | Low. | Responsibility Assumed

Mech. Work. | Hand | Mach-Hand | Mech. Used | Mental | Manual | Supervisory

Pay to start | Pr. Hr. | P. W. Possible? | Bonus for Prod. | Adv. to | Pr. Hr. when app.

Is Supervision Close? | Educat'nl Qual. Nec. | Prod. | Non. Prod.

Duties

Experience to start

Exp. for 1st Class Rating

Speak Eng. | Read | Write | Employes Sit. | Stand. | Move around | of Time

Work Heavy | Dusty | Dirty | Wet | Hot | Cold | Monotonous

Other Disadvantages

Nationality Pref.

Heaviest Wt. Lifted | lbs. | Const. | Occas. | Strength Required

Accident Hazards

Phys. disability acceptable

MENTAL REQUIREMENTS	PHYS. REQUIREMENTS	AVOID DISABILITY	
Mental Type	Strength	Pulmonary Trouble	Hand
Settled Type	Agility	Hernia	Sight
Directive Type	Lgt. Physique	Weak Heart	Hearing
Plodding Type	Normal	Leg	Rheumatism
		Arm	

THE FIRST TASK in the selection of a safe workman is to find one that meets requirements. On this form is listed specifications which aid in selecting the right individual for the particular job, physical requirements receiving much attention.

Matching Men and Jobs

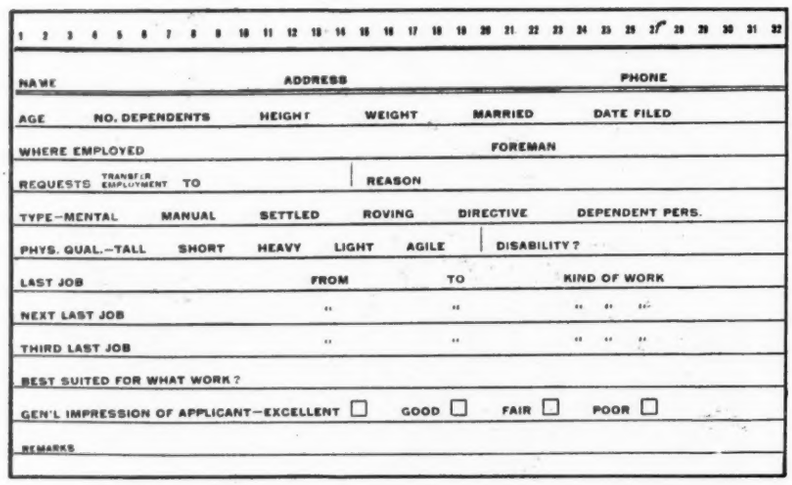
By CHESTER S. JOHNSON
Employment and Personnel Manager
Quaker Oats Co.
Cedar Rapids, Iowa

TWO expedients enable Quaker Oats Co. to keep accidents at a record low. One is a method of finding the right workmen for the particular job. The other is a system of training employees in the safe way of working.

When a department in the plant needs an employee, it sends a "job specification" card to the employment department. This card outlines in detail the type of employee who will best fill the opening, indicating whether the worker should be tall or short, light or heavy, mental or manual, and listing other qualifications (Fig. 1). It also outlines any accident hazards peculiar to the job.

To facilitate selection of an employee who meets these specifications applicants are carefully classified according to mental and physical characteristics (Fig. 2), particular stress being placed upon physical disabilities and previous experience. From this information, the employment department selects the most likely individual. But this man does not go on the job yet. First he must pass a physical examination in the company hospital. The physician takes the history of diseases, accidents and operations; condition of teeth, throat, heart, lungs and extremities. He notes the pulse and temperature, examines for hernia and venereal disease, and makes an analysis of the urine. He tests vision and hearing and finally makes recommendations as to the general desirability of the applicant from the physical standpoint.

With accurate and complete physical qualifications furnished by the physician, the employment department makes a further comparison of the applicant and the job to see if they match sufficiently well to insure safe as well as efficient workmanship. Care is taken that men with hernia are not placed at heavy manual work, those with weak lungs at dusty work, or those with heart ailment at machine operation or strenuous occupa-



1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32

NAME — ADDRESS — PHONE

AGE — NO. DEPENDENTS — HEIGHT — WEIGHT — MARRIED — DATE FILED

WHERE EMPLOYED — FOREMAN

REQUESTS TRANSFER EMPLOYMENT TO — REASON

TYPE—MENTAL — MANUAL — SETTLED — ROVING — DIRECTIVE — DEPENDENT PERS.

PHYS. QUAL.—TALL — SHORT — HEAVY — LIGHT — AGILE — DISABILITY?

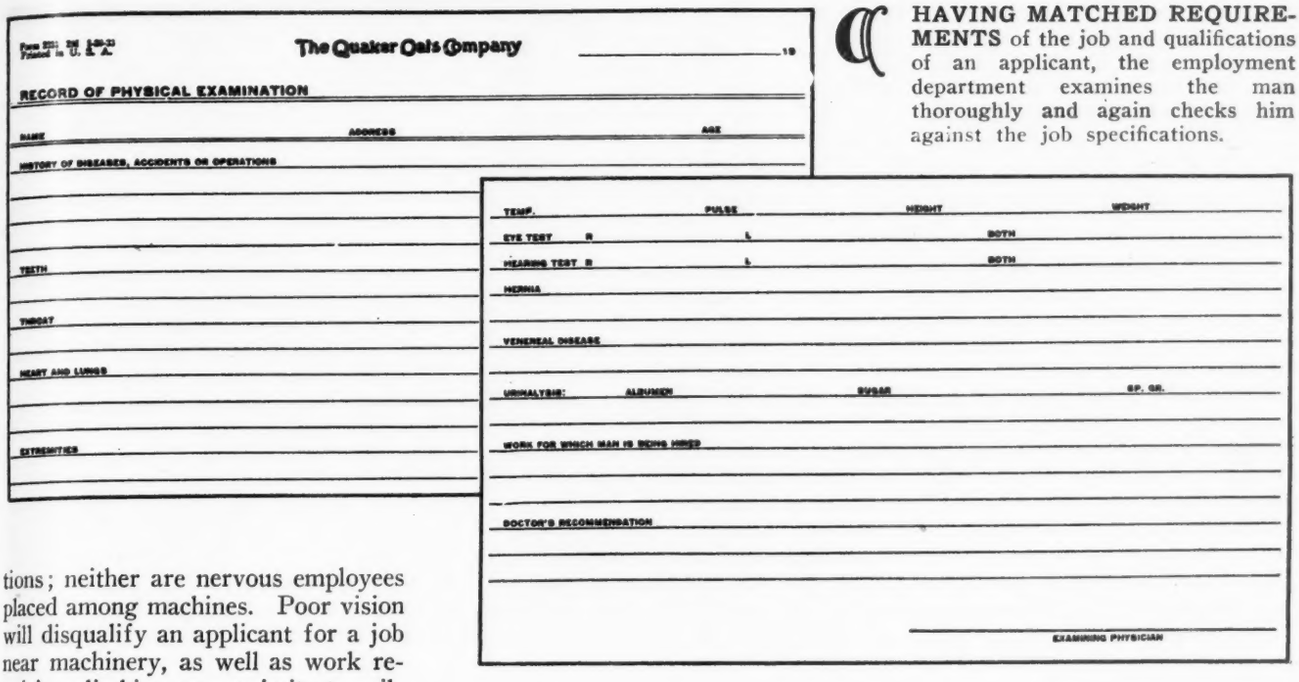
	LAST JOB	NEXT LAST JOB	THIRD LAST JOB
FROM		"	"
TO		"	"
KIND OF WORK		" " "	" " "

BEST SUITED FOR WHAT WORK?

GEN'L IMPRESSION OF APPLICANT—EXCELLENT ☐ GOOD ☐ FAIR ☐ POOR ☐

REMARKS

QUALIFICATIONS OF PROSPECTS must be at hand so that one meeting specifications may be called when needed. Physical and mental characteristics of applicants are listed on a form of this type and placed in the prospect file. Here again physical qualifications are important.



The Quaker Oats Company

RECORD OF PHYSICAL EXAMINATION

NAME ADDRESS AGE

HISTORY OF DISEASES, ACCIDENTS OR OPERATIONS

TEETH

THROAT

HEART AND LUNGS

EXTREMITIES

TEMP. PULSE HEIGHT WEIGHT

EYE TEST R L BOTH

HEARING TEST R L BOTH

HERNIA

VENEREAL DISEASE

URINALYSIS: ALBUMEN SUGAR SP. GR.

WORK FOR WHICH MAN IS BEING HIRED

DOCTOR'S RECOMMENDATION

EXAMINING PHYSICIAN

HAVING MATCHED REQUIREMENTS of the job and qualifications of an applicant, the employment department examines the man thoroughly and again checks him against the job specifications.

tions; neither are nervous employees placed among machines. Poor vision will disqualify an applicant for a job near machinery, as well as work requiring climbing or proximity to railroad equipment. Defective hearing bars him from tasks where failure to detect sounds may be dangerous.

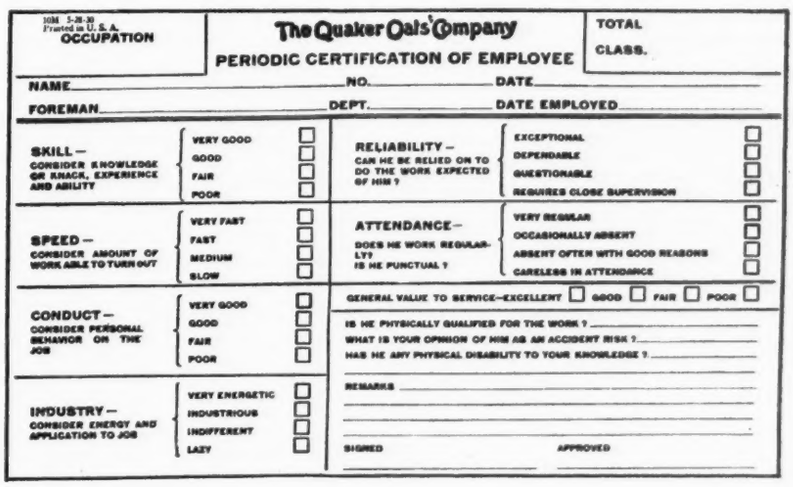
By this careful matching of man and job the employment department greatly reduces the probability of accidents. But precaution does not end there. Before he even goes on the job, the employee receives a safety suggestion book—which he is required to read. This impresses upon him the hazards that exist and suggests how to avoid them. It instructs him to report to the hospital for treatment of all minor hurts, no matter how insignificant they may seem at the time. It gives him instructions in the use of such equipment as manlifts. And in general it makes the worker realize that in the Quaker Oats Co. plant he is expected to do his work the safe way. The employee also receives a copy of another booklet, "The Safe Worker"; this to read at his leisure.

With this general training on safety completed by the employment department, the worker is taken to the foreman, who points out the specific dangers of the job and lays down the rules of safe workmanship. The employee next comes in contact with the "safety man" in his department, it being the duty of this individual to make sure that new employees know how to work safely.

Though the employee be carefully selected and trained, never is his suitability for the job and his safety as a worker taken for granted. The person in direct supervision of the man must make out periodically a form certifying his qualifications and rating him as an accident risk (Fig. 5). This form is made out one week after the employee has been on the job, again after a month, and then once every six months. If at any time the check shows unsatisfactory results, immediate corrective steps are taken.

The precautions taken to prevent accidents to new employees have shown real results. For several years prior to the depression, about 20 per cent of the labor force was made up of employees with less than six months of service. And that "green" one-fifth of the force was responsible for less than one-fourth of all time lost due to accidents. In 1933, lost time resulting from accidents to new employees was higher, 14 per cent of the force contributing 28.5 per cent of the total time lost. This is an interesting phenomenon and would seem to illustrate strikingly what depression troubles and jobless inactivity will do to workers.

In addition to making accidents few and far between, the careful selection of workers materially improves the caliber of employees in the plant.



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OCCUPATION

The Quaker Oats Company

PERIODIC CERTIFICATION OF EMPLOYEE

TOTAL

CLASS.

NAME NO. DATE

FOREMAN DEPT. DATE EMPLOYED

SKILL— CONSIDER KNOWLEDGE OR KNACK, EXPERIENCE AND ABILITY: VERY GOOD ☐ GOOD ☐ FAIR ☐ POOR ☐

RELIABILITY— CAN HE BE RELIED ON TO DO THE WORK EXPECTED OF HIM? EXCEPTIONAL ☐ DEPENDABLE ☐ QUESTIONABLE ☐ REQUIRES CLOSE SUPERVISION ☐

SPEED— CONSIDER AMOUNT OF WORK ABLE TO TURN OUT: VERY FAST ☐ FAST ☐ MEDIUM ☐ SLOW ☐

ATTENDANCE— DOES HE WORK REGULARLY? IS HE PUNCTUAL? VERY REGULAR ☐ OCCASIONALLY ABSENT ☐ ABSENT OFTEN WITH GOOD REASONS ☐ CARELESS IN ATTENDANCE ☐

CONDUCT— CONSIDER PERSONAL BEHAVIOR ON THE JOB: VERY GOOD ☐ GOOD ☐ FAIR ☐ POOR ☐

GENERAL VALUE TO SERVICE—EXCELLENT ☐ GOOD ☐ FAIR ☐ POOR ☐

INDUSTRY— CONSIDER ENERGY AND APPLICATION TO JOB: VERY ENERGETIC ☐ INDUSTRIOUS ☐ INDIFFERENT ☐ LAZY ☐

IS HE PHYSICALLY QUALIFIED FOR THE WORK?

WHAT IS YOUR OPINION OF HIM AS AN ACCIDENT RISK?

HAS HE ANY PHYSICAL DISABILITY TO YOUR KNOWLEDGE?

REMARKS

SIGNED APPROVED

THE EMPLOYEE NEVER IS FORGOTTEN. The individual directly in charge of him must periodically certify his suitability, checking physical qualifications and indicating his rating as an accident risk. This form is made out one week after the employee starts, one month later, and then twice annually.

Wine makers who use clarifying powders to brighten up cloudy wine should study carefully the chemical byproducts of these powders. Addition of small quantities of skimmed milk or good vegetable carbon before filtering gives desired results without any questionable residues.

Wines in storage often become cloudy in a short time even though they were bright after being filtered.

New Ways to Clarify "Sick" Wines

By S. BLUMENTHAL and M. D. BLUMENFELD
Shirley Laboratories
New York, N. Y.

PERHAPS one of the most irritating problems with which the wine maker must contend is the treatment of diseased wines. Such wines usually are cloudy or slightly hazy. A bright wine may be obtained after filtration, but, upon standing a short while, will again throw out a cloud. After much experimental work in an attempt to remove the cause of the disease permanently, we have been able to devise several methods which give uniformly good results.

First, the diseased wine is clarified and decanted. When it becomes diseased again, 1 oz. of skimmed milk is added for every 50 gal. of wine, and without giving the flocculent precipitate which forms a chance to settle, the wine is filtered.

Adding 2 oz. of a good vegetable carbon for every 50 gal. of cloudy wine, agitating, allowing to stand for 48 hours, and filtering through asbestos pulp filters give gratifying results. The bouquet lost by the wine is negligible. It has been our experience that the use of vegetable carbons in wines during the processes of filtration and purification gives striking results. Young wines take on age. This is especially true in white wines.

We believe the use of vegetable carbons in the purification and filtration of wines opens up a new field for research on the rapid aging of young wines.

These conclusions have not been hastily arrived at, but after much research on the problems of wine clarification and aging.

The chemical composition of the expressed grape juice—that is, the "must"—is exceedingly complex. It contains from 70 to 85 per cent of water; dextrose and levulose, 10 to 30 per cent; and tartaric acid, racemic and malic acids, albuminoids, pectins, gums, proteins, tannins and coloring matter. The pectins, gums, albuminoids and tannins, among other things, are not dissolved in the must, but remain suspended in it, due in part to the buoying effect of the carbon dioxide gas given off during fermentation and in part to the colloidal nature of these substances.

After the primary fermentation, the heavier particles—that is, the grape stems, skins and seeds—settle out. The colloidal materials—the complex carbohydrates, pentosans, proteins and pectin bodies—remain suspended and the wine is cloudy.

These substances will eventually settle, if given sufficient time. However, it is our opinion that the wine should be cleared as quickly as possible after the primary fermentation. The presence of the suspended materials in the wine, which are food for microorganisms and offer a favorable environment for their propagation and growth, may result in a wine that is contaminated with bacteria and wild yeasts during the secondary or quiescent fermentation. Under such conditions, the wine may take on a "mousy" odor and a bitter taste and thus become unfit for use.

Many substances are used in attempts to clarify wines. Some of the most common are gelatin, tannic acid, isinglass, egg albumin, casein, talc and calcium sulphate. Gelatin may be used alone or in definite proportions with tannic acid to form a heavy, flocculent precipitate which settles to the bottom, carrying with it the suspended materials. The other substances depend for their clarifying action on the property of forming a

finely divided, suspended mass throughout the liquid, then settling out and carrying with them the colloidal particles.

These clarifiers have their advantages and disadvantages. Gelatin when used by itself is partly soluble in wine. If used in conjunction with tannic acid, some of it may remain in solution if there is insufficient acid to combine with it. Gelatin also has the added disadvantage of removing some of the tannins from the wine, thus bleaching it. Isinglass, casein and egg albumin also are partly soluble.

Calcium sulphate and talc, while they clarify to a certain extent, do not result in a perfectly clear, brilliant wine. Naturally, if the wine were to be heated, the soluble proteins would coagulate and precipitate; but this is not feasible and might render the cost prohibitive.

As wine itself is so complex in chemical composition we hit upon an idea that it would be better to work out combinations of chemicals which among themselves give a heavy, flocculent precipitate which yield either insoluble byproducts or harmless soluble ones and which would remain in solution permanently; not precipitate at some future time. Working along these lines, we used combinations of zinc sulphate and potassium ferrocyanide; potassium aluminum sulphate and sodium carbonate; potassium aluminum sulphate and dibasic sodium phosphate; aluminum hydroxide; silica gel; bentonite; air-floated silica; barium sulphate; and vegetable carbons.

In using chemicals whose combination yielded a precipitate it was found advisable to add them in molecular proportions in order to precipitate each as completely as possible. The results given below are a digest of the work conducted, which was much more extensive. A paper of this size prevents our outlining completely the experimental work done.

Zinc sulphate and potassium ferrocyanide give a heavy, white, flocculent precipitate of zinc ferrocyanide which settles to the bottom, carrying with it the suspended material. Each of the chemicals was dissolved separately in water and added to the wine in the barrel. The barrel was rolled around several times to mix the chemicals. Settling took place overnight and left a clear, bright wine. The possibility of some of the ferrocyanide breaking down into cyanide under the action of the acid in the wine was an important question. We developed an extremely sensitive method for the detection of traces of cyanides in wine, and found that all the wines which had been clarified by means of zinc sulphate and potassium ferrocyanide showed marked traces of cyanides.

Quantity of colloidal matter in wines depends considerably upon whether the must is expressed before or after first fermentation. Press cloths in the large wooden presses are expected to hold back chiefly the macroscopic solids.

●

Photochemical action of light will cause cloudiness in some wines after they are bottled unless the bottles are of colored glass or are wrapped to exclude light as well as to prevent breakage during stockroom handling and shipping.

Aluminum Hydroxide Used

The combination of potassium aluminum sulphate and sodium carbonate yields a dense white precipitate of aluminum hydroxide. Four and one-half ounces of potassium aluminum sulphate was dissolved in a little water and added to the barrel of wine. Three ounces of sodium carbonate was dissolved and added, and the barrel rolled several times to insure proper mixing. The precipitate settled rapidly and well, and gave a clear, bright wine.

A heavy, flocculent precipitate of aluminum phosphate and aluminum hydroxide results from the combination of potassium aluminum sulphate and dibasic sodium phosphate. Three ounces of alum and 3.3 oz. of dibasic sodium phosphate dissolved separately in water and added to the wine gave good clarification.

(Turn to page 274)

"Dumb Housewives"

BY ONE OF THEM

WHEN the food manufacturer visions the housewives to whom he wishes to sell his product, what kind of a composite picture does he see in his mind's eye? I know the vice-president of one large food concern speaks of them as "damned dumb, lazy women," and I have heard similar expressions of opinion from other food executives. Now, I ask you, is that the way to think of the people who spend the money that pays their salaries?

Quite apart from any possible ethical feeling on the subject, how can they expect their sales and advertising approach to these women to ring true when it is planned in such a frame of mind? And the "ad" writers reflect their attitude.

Advertisements Misleading

Read, with an unprejudiced, open mind, the food advertisements in the women's magazines, and what is your reaction? Bunk and ballyhoo? Clever traps for rather stupid, gullible readers, rather than honest, clear-cut presentations about the food they buy—its actual value in the diet of the family. Often obviously just advertising stunts built around "slogans"; or far-fetched, exaggerated claims which must have been made with the tongue in the cheek; always the effort to capitalize on the latest fad. Vitamins have been worn down beyond the joke stage by overwork, and the slenderizing idea has attained the ridiculous, as evidenced by an advertisement for a product whose chief ingredient is a fat. Another "ad" for a concentrated sweet makes, by indirection, an equally illogical claim to being non-fattening—at the same time it flaunts its adulteration in capital letters. If the copywriter was attempting the old trick of playing up an objection, made so popular years ago by the unexpected success of "It Floats," he should remember this theory was disproved when the slogan disappeared under the rising popularity of showers. Floating soap was quite obviously a convenience in the tub and not the disadvantage the manufacturer believed it to be. Just an ancient example of a manufacturer who did not appreciate the needs of his consumer and met them by accident.

Of late, the magazines have been monotonous with imitation comic strips, spouting impossible conversations which in real life would label the speakers bores to be avoided if not subjects for mental observation. Worst of all, perhaps, the quarreling husbands and wives, the bad dispositions cured with miraculous ease by the advertiser's food; suppose she tries it and his disposition gets worse! The scare heads, the horrible faces, are especially disgusting. The "ads," for instance, show a not especially housewifely appearing woman making a terrible face over the odor of a rival's product, and grinning like a Cheshire cat over the advertiser's. To say nothing about breaking the golden rule of salesmanship: "Never knock your competitor," this manufacturer has deliberately raised a doubt in the consumer's mind as to the wholesomeness of the food he is trying to sell, associating it with something most unpleasant. Such is human nature that one member of my family has become firmly convinced that the product he believes to have been maligned has a much better texture and flavor than the advertiser's.

If a product has any excuse for existence, there must be a straightforward, honest story which can be told about it, to induce the consumer to spend her money for it.

"Customer Service"

Many manufacturers offer what might be called "service" to their customers, although usually it is merely not-too-well-considered information as to how to use their product. Let me give an example of one woman's attempt to take advantage of such an offer. The product was a commercial pectin which included a book of formulas for its use. These formulas called for an unusually large quantity of sugar. A letter questioning the necessity for so much sugar and asking if less could not be used, brought a reply, signed apparently by the manufacturer's expert, to the effect she did not know but she hoped the inquirer would try it with less sugar and advise her as to the result! This occurred about five years ago, but this preparation is still being marketed with the statement that the obviously out-of-proportion formula must be followed to insure good results—with the consequent claim to more jelly from a basket of fruit. It has been my experience that women generally complain they do not like the product because jellies and jams made after the formulas are too sweet. Naturally, the farm and village women, who do the bulk of the preserving and get their fruit for the picking, object to the additional expense for sugar.

Recipes purporting to have been worked out in the manufacturer's test kitchen are a common form of service offered.

The reader naturally visions a

- After the well-appearing, moisture-proof, airtight packages have been opened they must stand around on open pantry shelves subjected to dust, moisture, and insects—most unattractive in appearance with their cut flaps standing out at all angles and certainly not sanitary.
- Round packages take up excessive space in the limited storage facilities of the apartment kitchen.

white enameled, laboratory kitchen, presided over by a domestic science expert, a chemist, an assistant or two. Attractive, isn't it, with all the up-to-date gadgets to try out old recipes and invent new ones, and new ways of doing things? But apparently these magic kitchens are not equipped with scales. The same old recipes grandmother struggled with—a cup of this and a teaspoonful of that, not a pound or an ounce in a thousand formulas. Did the food manufacturer ever try to pack a cupful of solid shortening, just out of the refrigerator, perhaps, then scrape it out and wash the greasy thing? How much easier to pile the shortening on a piece of wax paper, weigh it, and put the can back into the refrigerator while only the quantity needed, and not the whole supply, warms sufficiently for use.

And flour: "Sift before measuring"; how much more accurate and simple to weigh it. Can you imagine a baker sifting and measuring his flour with a teacup? Most women have scales, and those who do not, probably do literally use a teacup without regard to its capacity. Give cup measurements for those who do not have scales or are too old-fashioned to use them, but first look up the statistics on the number of household scales sold, and remember their buyers.

The Housewife's Touch Needed

And why do these formulas always produce a prosaic sort of cake or pie crust—reminiscent of bakers' products? A little change by a good cook and what a difference! There is a pie crust recipe, for instance, which the writer—who is by no means an expert cook—reduced to ounces, added to and subtracted from until even she could produce a pie crust guaranteed to excite the gastric juices of the most exacting New England epicure. During a long vacation from the kitchen the slip of paper vanished, and through following the manufacturer's formula, an ordinary, uninspired pie resulted.

We grow weary of all these recipes —cakes, salads, desserts, entrees— surely there must be basic formulas on which to practice changes, rather than to start from scratch for every one. The good cooks have their own dependable methods, while we amateurs flounder in the morass of complicated, conflicting, time-consuming instructions, which almost invariably lack the spark of genius which makes the difference between real food and just something to eat.

Tell us how to substitute your product in our pet cake, dessert, or whatnot, as well as how to make a new dessert the family may have to be taught to like. Men are creatures of habit—you know how they clamor for this or that which mother used to make—and dinners must be planned to please men, even if luncheons may be trifles to please women friends and children.

Packages Not Well Designed

And the packages—don't let us forget the packages—designed so obviously for the grocery shelf and not the pantry shelf; to catch the eye, to handle easily and preserve the product until it reaches the kitchen. But after these well-appearing, moisture-proof, airtight packages have been opened, they must stand around, probably in wooden cupboards, on open pantry shelves, subjected to dust, moisture and insects; most unattractive in appearance with their cut flaps standing out at all angles and certainly not sanitary.

Some of the more common measuring devices found in a housewife's kitchen.

Round packages may be cheaper, but they take up excessive space in the limited storage facilities of the apartment kitchen. Odd-shaped bottles stand out among their more conventional companions on the grocer's shelf but are a nuisance in a crowded cupboard. I have in mind especially a fat, squat vinegar bottle which fitted the big hand of the grocer perfectly but could be grasped only with difficulty by the average woman. It had the dribble habit in pouring and required twice the shelf space of the ordinary bottle.

If the manufacturer must tempt us with fancy packages and with "premiums," why not glass or metal containers for his food products? Preferably sold at cost of manufacture and distribution rather than "free" with a cheapened product. They might be a welcome change from the everlasting recipe book, cake pan or gadget.

Now as to this accusation of dumbness: It is true some of us fall for fancy packages without regard to contents; eye-catching "premiums" for a clamoring child, or cheap gadgets we do not need which merely serve to clutter up our kitchens. Probably this is dumb, but who laid the trap for our pennies?

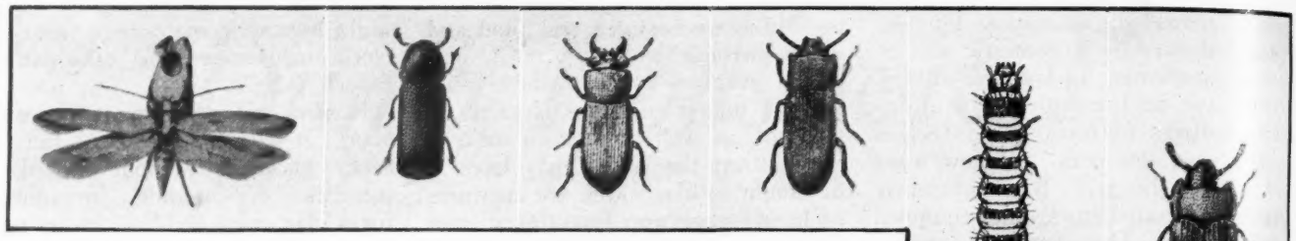
And how about the large dairy concern which would not deliver pint bottles of cream to the housewife because they thought she ought to have half-pint bottles fresh every morning! In the hot summer time, too, in the days of refrigerator ice creams, strawberry shortcakes and milk surpluses? It seems possible that neither the housewife, nor yet the farmer, may have monopolized the supply of dumbness.

As to being lazy, why not? Laziness has spurred many a labor-saving invention for the advancement of leisure, comfort and health; for the elimination of drudgery, dirt and ugliness. This same "laziness" enlarges the field of the food manufacturer—in fact without it he would have no field; we would be back in the pioneer days when food was manufactured in the home. He probably would be surprised how much of it is still manufactured in the home because of distrust of commercial products.

Wholesomeness Wanted in Food

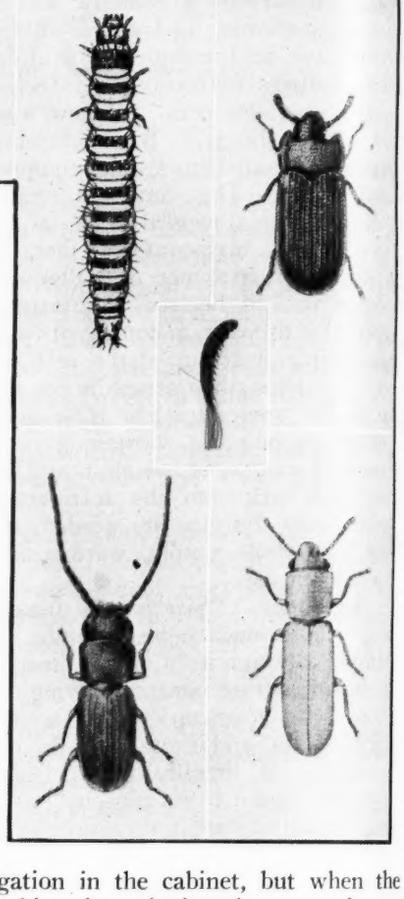
Whatever the manufacturer may believe, the majority of us do buy food for our families primarily to make and keep them well and strong; economically as a rule, but with a luxury now and then as finances permit, to vary the monotony, to tease uncertain appetites, to satisfy the epicure which lies more or less dormant in even the most indifferent eater. We want to know what is in your product, the quality of its ingredients, the truth about your claims for vitamins, enzymes and other discoveries of the chemist and the doctor.

Partially prepared, labor-saving foods are priceless to the overworked mothers of large families, to the business woman, to the physically delicate, and, of course, are indispensable to the lazy woman. What a field for honest service by honest products! But undervaluing, despising, disliking your public will never get you a hand.



Storage Beetles

Are Found in Almost Any Food Plant



By HARRY STINER
New York, N. Y.

CAUTION

Sodium fluoride and sodium arsenite are poisonous to humans as well as insects. Health regulations in some cities and states prohibit their use in food plants. Before using poisons be sure that they are permitted—and then be exceedingly careful.

ANY food plant would be clean indeed if it could boast of having no storage-beetle troubles. These insects constitute a menace no plant can afford to ignore. In number of varieties, they are well ahead of any other storage pest, and to a large extent their habitats are confined to refuse and to edible foodstuffs; nevertheless, they are found in other places such as corners, cracks or crevices of floors, machinery and equipment, and are generally on the move. The reproduction rate is high with most of them and they are remarkably free from natural or parasitic control. They are for the most part universal feeders and in a general sense any food plant will contain a number of foods for them.

While the number of varieties in any one plant depends to a large extent upon the foods handled, as well as the locality, the following list of types has been arranged in what seems to be their relative importance from an economic angle.

Sawtoothed Grain Beetle

These evasive little pests are less than $\frac{1}{10}$ in. long, of an even dark brown color, slender, flat, and quite active. Along each side just back of the head are six points resembling sawteeth, whence their name. The adults live about nine months and lay around 150 eggs during this period. The larvae (worm forms) are active little creatures about one-half as long as a kernel of wheat. Their food consists mainly of cereals, dried fruits, nuts, seeds, and almost any product made from them. Although their ravages are more noticeable in long stored materials, any of the above foods are subject to their attack, whether stored or in transit.

Control of these pests usually is obtained by either fumigation or destroying the product—often by both. Cold storage, while holding them dormant and preventing further infestation below 40 deg. F., requires a much lower temperature to kill them. Heat above 125 deg. F., however, will kill them in short order (see Formula No. 9*). Once a commodity intended for distribution becomes infested with them there is seldom any relief except to destroy it entirely and either thoroughly spray that immediate section or fumigate the room. Samples in cabinets are very frequently attacked by these beetles. In many instances the samples may be salvaged by fumigation in the cabinet, but when the cabinet is such that they must be removed for treatment, it should, of course, be thoroughly sprayed inside before they are replaced. A satisfactory fumigant and spray will be found in Formula No. 8*.

In general, the sawtoothed grain beetle will be found very undesirable and quite difficult to eradicate once it becomes established. On the other hand, it should never become a serious pest if all stored foodstuffs, not in cold storage, receive either a frequent turnover or fumigation and if a reasonable degree of cleanliness is practiced.

Flour Beetles

Just what is the difference between a flour beetle and a grain beetle is more or less of an unanswered question. In a comprehensive bulletin, No. 1260 of the U. S. Department of Agriculture, entitled "Stored Grain Pests," Black and Cotton list six species designated by name as flour beetles and seven or eight as grain beetles. However, any of the so-called flour beetles may be found occasionally in stored grains. Likewise, any of the grain beetles may be encountered in flours, or at least in coarse cereals. In general pest

*FOOD INDUSTRIES, April, 1934, pp. 160-162.

control work, however, the individual identity of any beetle found in a bin of grain is of no particular consequence, as the same common treatment goes for all of them. The same holds true with flour and cereal products, except in a few instances which will be explained later.

Two of the so-called flour beetles, the "confused" and the "rust-red," are the most frequently encountered in flour and cereal products. Their activities are not confined to stored flour, however; they are often found in flour-handling machinery, bakery products, stored dried fruits, nuts and similar foodstuffs. They are similar in appearance, about $\frac{1}{6}$ in. long, of a reddish brown color, slender, somewhat flat, and quite active. Control measures for these insects vary with the commodity and their location. Infested flour or fine cereals should first be fumigated (Formula No. 8*) or heated (Formula No. 9*) and then sifted to remove the insects. Coarse cereals cannot always be cleaned economically. For that reason the usual procedure is to fumigate the material and, when it is heavily infested, divert it to some other channel.

In flour-handling equipment, such as bolters, sifters, conveyors, bag cleaners and chutes, the insects frequent and breed to a large extent in cracks and corners beneath deposits of flour, moth web, and the like. As the insects mature, they crawl to the surface, where they are caught in the flour stream to be carried into the finished product. To reach these breeding spots effectively the flour dust and webbing must first be removed. Thorough brushing out is sufficient in most instances; however, it does not always reach to the bottom of deep cracks or out-of-the-way corners. A more satisfactory method is the use of compressed air applied with a long nozzle, or, better still—and much cleaner—is a suction apparatus. This can be obtained either from a general piping system or by portable outfits such as are used in cleaning office buildings. These machines can also be used in cleaning floors, overhead machinery, and places difficult to reach, thus preventing the development of other breeding places for the insects.

Like the sawtoothed grain beetle, previously described, these flour beetles are general pests among all bakery products, and treatment is the same as for the sawthoothed grain beetle.

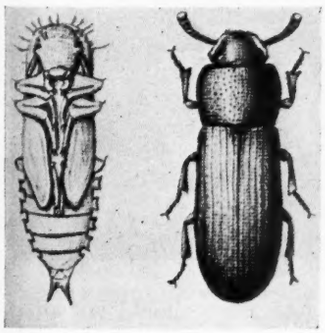
Other Grain Insects

"Grain beetles" vary in size from $\frac{1}{16}$ to $\frac{1}{8}$ in. in length, are slender, somewhat flat, usually chestnut brown, and, for the most part, active. The weevils vary in that they are thicker and more robust, about $\frac{1}{8}$ in. long, usually slower, and feign death when molested. The granary weevil is brown, while the rice weevil—the larger of the two—is often almost black and possesses well-developed wings. The most noticeable difference in the appearance of the weevils and beetles is that the head of the weevil is extended forward into a slender, curved beak, nearly as long as the main part of its body.

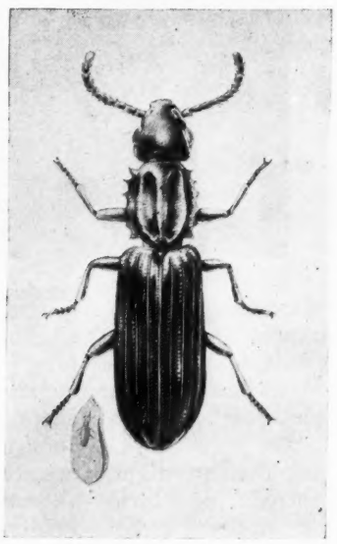
The main difference in their habits is that the two weevils are essentially whole-grain pests. They will live in coarse cereals, but do not tarry long around flours. On the other hand,

Heat-treatment, fumigation, screening and destruction of infested materials are resorted to in effort to keep these pests under control

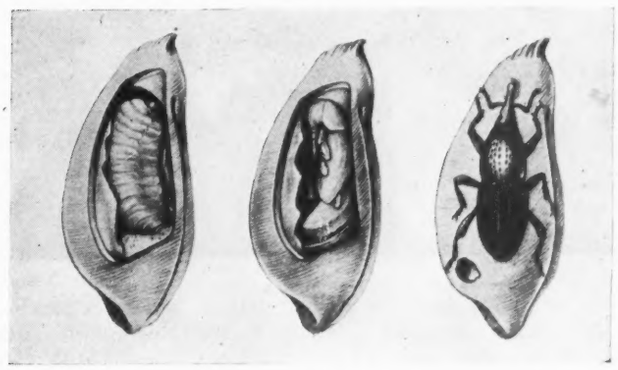
Confused flour beetle.

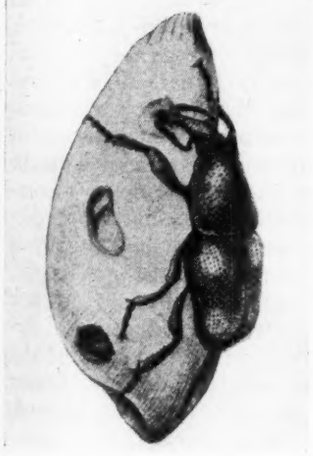


Sawtoothed grain beetle.

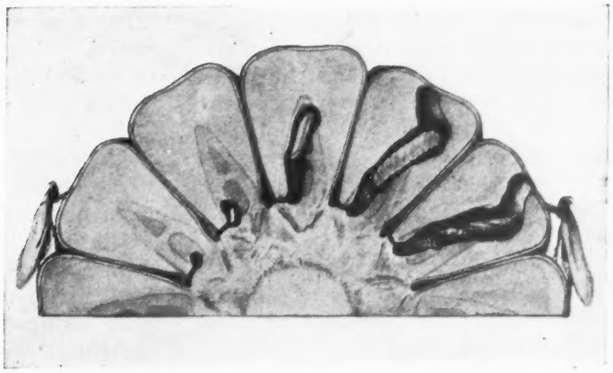


Life stages of the granary weevil in wheat.





Rice or black weevil in wheat.



Angoumois grain moth in corn.

many of the beetles, as previously stated, may be found in fine cereals and flour, while some of them will infest bakery products and stores.

There is another type of insect of major importance found in stored grains: the grain moths. These, although more delicate and totally different in form, produce equally injurious effects on the grains. They are controlled in stored grains by the same general treatment as are the beetles. The principal offender in this group is the so-called "Angoumois grain moth." It is of the butterfly order when full grown, measuring about $\frac{5}{16}$ in. long when at rest and is of a buff or yellow-brown color. The larvae (worm stage) develop within the kernel of grain and emerge as fully developed moths.

Protection of grains from storage pests involves many angles, but as this article deals with raw materials in food plants, only those troubles encountered after the materials reach the plant will be dealt with.

First, all insects are born; they do not "just happen." If a load of grain is put into a clean insect-tight bin and later develops an infestation, the grain certainly contained the pests in some form when it was put in. The main thing, however, when the grain is infested—or even suspected—is to treat it.

For this purpose heat-treatment is often used, particularly when the quantity is not large and the necessary equipment is at hand. The usual process is to subject the grain to a dry temperature of 140 deg. F. until fully heated through. It is then cooled by a fan-and-screen method and placed in clean receptacles. If taken from bins, these also should be either sprayed or fumigated, as many insects will have remained when the grain was removed.

Turning methods are also commonly practiced. These consist essentially of transferring the grain from one bin to another, thus disrupting the concentration of heavily infested sections and cooling the grain. This, of course, does not remove or destroy the insects, but it does furnish a temporary check to heating from moisture and insect activity, which is so fatal and common in stored grains. Occasionally the grain will be directed through some form of cleaner during the turning operation. This process, if thorough, will remove a majority of the adult insects, but, of course, will not molest the grubs—or young ones—within the kernels.

Fumigation is the most efficient method of treating stored grains in large storage bins. When properly done it is much more thorough, lasting, and inexpensive than the other methods. For large or small bins of grain the procedure is about the same, varying mainly with the kind of fumigant applied. The basic gases most commonly used and which furnish a sufficiently broad choice in most cases are: cyanide, carbon bisulphide and mixtures of ethylene oxide with carbon dioxide and ethylene, or propylene dichloride with carbon tetrachloride (see Formula No. 8*).

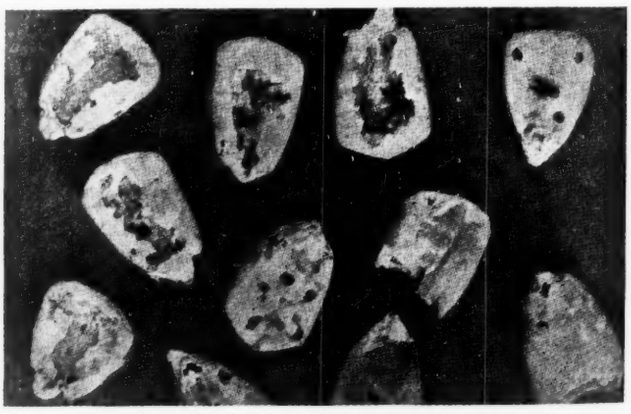
In large, tall bins that are tight, cyanide is used by introducing a form of calcium cyanide into the grain stream as it goes into the bin. By so doing it is evenly distributed throughout the mass. Instructions and dosages should always be obtained when purchasing this material. Carbon bisulphide should not be used in large bins, because of its explosiveness. The ethylene oxide-carbon dioxide mixture is used by mixing the straight ethylene oxide liquid (a gas at ordinary temperature but it can be held in liquid form by a few pounds pressure, or a low temperature) with crushed solid CO_2 and bran. The dosage is from 2 to 4 lb. of ethylene oxide per 1,000 bu. The ratio usually is about 1-8-3 respectively by weight. This mixture always is made just before using and may be applied to the grain stream in the same manner as calcium cyanide. Ethylene dichloride-carbon tetrachloride mixture, although a liquid at normal temperature, evaporates too rapidly when applied to the wheat stream of tall bins. It therefore should be introduced through a tube directly into the grain at intervals during the filling. The dosage is from 15 to 30 lb. per 1,000 bu. Propylene dichloride-carbon tetrachloride mixture, being somewhat less volatile than the ethylene dichloride mixture, is often applied directly to the wheat stream during the filling of the bin. The dosage is 15 to 30 lb. per 1,000 bu.

Each of the three last-named mixtures has a relative toxic value and cost in the order listed, but while the cost is less with the propylene mixture, that alone should not affect a choice. The minimum exposure time for cyanide in large bins should be about 24 hours; for the others, about 48 hours. However, with all fumigants more satisfactory results are obtained by longer exposures.

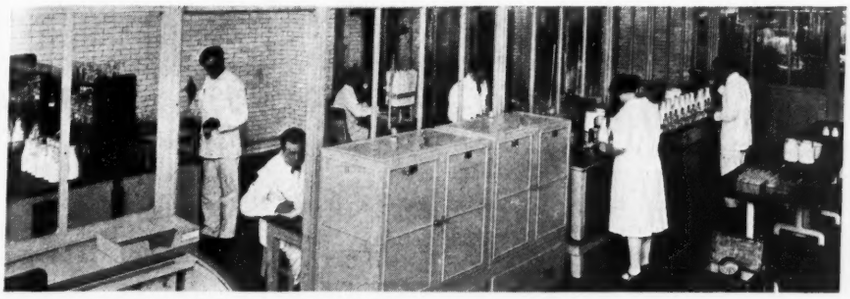
Small bins, such as storerooms or holding bins, may be treated with the same gases, except cyanide, as recommended for the larger ones. The difference is that the material usually is thrown directly into the grain pile. Box cars and outside small bins are successfully treated with carbon bisulphide, by pouring it on top of the load. The ethylene and propylene dichloride mixtures also may be used, and in the same manner.

Kernels of wheat after infestation with lesser grain borer.

Effect of rice or black weevil infestation of corn.



Calculating Composition of Milk From Fat Test Alone



The control laboratory of a large dairy company.

Simple formulas give total solids and protein content of normal mixed milk

By J. C. MARQUARDT

New York State Agricultural Experiment Station
Geneva, N. Y.

USERS of liquid milk as an ingredient often must know on short order its total-solids content to calculate proper proportions of other ingredients. Dealers in and inspectors of liquid milk are also interested in a quick method for determining total solids as a ready check on whether a milk has been watered or otherwise adulterated. Sometimes it is highly desirable to know the protein content also.

Studies have shown that the total-solids and the protein content of "mixed milk" (milk from a number of cows) closely parallels the fat content of the same milk. In fact, the relationship is so constant that a suitable method of determining these constituents has been developed in which the fat content of the milk is the only required known factor.

As the fat percentage may be determined quickly by the Babcock method and used as a factor in the simple arithmetical formulas:

$$\text{Total solids} = 7.627 + (1.346 \times \text{fat test})$$

$$\text{Protein content} = 1.597 + (0.446 \times \text{fat test})$$

the calculations become quite elementary and give comparatively accurate results quickly.

The one for total solids comes within 0.1 per cent of the actual value for solids as determined by drying. This being true, the value determined by the total-solids formula would deviate but little from that calculated by the commonly used formula employing the Quevenne lactometer reading and the fat test. Calculating total solids from fat content only for a 4-per-cent-fat milk with 13.00 per cent of total solids as determined by drying, we have:

$$\text{Total solids} = 7.627 + (1.346 \times 4) = 13.01 \text{ per cent}$$

Calculating the total solids from the Quevenne method, taking 4-per-cent-fat normal mixed milk, which has a lactometer reading of about 33, we get:

$$\text{Total solids} = \text{lactometer reading } 4 + (1.2 \times \text{fat test}) \text{ or Total solids} = \frac{33}{4} + (1.2 \times 4) = 13.05 \text{ per cent.}$$

The average deviation for these two calculations falls within 0.1 per cent. Individual cases will vary more than this. But even in extremes, the figure for total solids will not vary more than 0.2 per cent for the three methods—fat test alone, fat and Quevenne lactometer reading, and actual determination.

The formula for figuring protein content also gives a value within 0.1 per cent of the determined value for average normal mixed milk. In such milk having a fat test value of 3.9 per cent the protein content as determined by analysis amounted to 3.4 per cent. Using the formula and calculating the protein content for a 4-per-cent-fat milk, from fat value alone, we have:

$$\text{Protein content} = 1.597 + (0.446 \times 4) = 3.381, \text{ or } 3.4 \text{ per cent.}$$

Analysis of another normal mixed milk yields further evidence of the accuracy of these protein and total-solids formulas. This milk contained 3.8 per cent of fat, and chemical analysis showed the protein content to be 3.2 per cent and total solids 12.72 per cent. The calculated percentages were 3.3 for protein and 12.72 for total solids.

If further evidence of accuracy be needed, it is given by the accompanying table comparing calculated and determined values for Jersey, Guernsey, Ayrshire and Holstein milks. The determined and calculated total solids check within 0.1 per cent for Jersey, Guernsey and Ayrshire milks. For Holstein milk the variance amounts to 0.2 per cent. The calculated protein values are 0.4 per cent higher than the figures obtained by analysis for Jersey and Guernsey milks and 0.2 per cent higher for Ayrshire and Holstein milks. The table reveals further that the calculated and determined values for total solids and proteins check very closely for normal mixed milks.

These comparisons were made with reliable analysis by Hart and formulas developed by Anderson and others. Like comparisons can be made with analyses from other sources.

REFERENCES

Anderson, A. C., et al: Om Sammensaetningen og Forbraendingsvarmen af dansk Komaelk Den Internationale Mejerickongres, 1931.

Hart, E. B., and Tottingham, W. E.: General Agricultural Chemistry, State Journal Printing Co., Madison, Wis., 1913.

Breed	Fat	Total Solids Percentage			Protein Percentage		
		Determined	Calculated	Variation	Determined	Calculated	Variation
Jersey	5.80	15.40	15.43	+0.03	3.68	4.18	+0.40
Guernsey	5.40	14.90	14.90	0.00	3.60	4.00	+0.40
Ayrshire	3.76	12.75	12.69	—0.06	3.07	3.27	+0.20
Holstein	3.25	11.80	12.00	+0.20	2.85	3.05	+0.20
Mixed	3.90	12.90	12.87	—0.03	3.40	3.37	—0.03

BAKING *Is More Than Heating Dough at a Temperature for a Given Time*

By G. R. FENNEMA
Baldwin, N. Y.

● In the recent series of articles on bake ovens by Harry Carlton (Food Industries, November and December, 1933, and January, March and April, 1934), reference was made to oven atmosphere and its influence upon the quality of the baked products.

● The object of this article is to discuss more fully this subject of oven atmosphere with the hope that someone even more conversant with the chemistry of baking will contribute further information on the composition of the gaseous fluids produced in the baking chamber and the importance of these gases on aromatic bread flavors.

● In this connection one will realize that the observance of proper time and temperature of baking is not the sole essential in the production of a good loaf of bread. It is our conviction that the state and temperature of this gaseous fluid in the baking chamber have much to do with the quality of the baked product.

AS regards oven standards, it might be well to establish a permanent method of procedure in determining oven efficiency and fuel efficiency. I wish to suggest that for the oven efficiency we weigh the dough entering the oven and weigh the bread upon leaving the oven. The oven efficiency may then be calculated from these two weights.

$$\frac{\text{Bread output (lb.)} \times 100}{\text{Dough input (lb.)}} = \text{per cent oven efficiency}$$

The fuel efficiency of the oven may be calculated by determining the calorific value of the fuel and the pounds of fuel burned per 1,000 lb. of dough entering the oven.

$$\frac{\text{Units to bake dough}}{\text{Units in fuel to bake dough}} = \text{fuel efficiency}$$

If we are inclined to accept these efficiencies as standard, we must, by agreement, settle upon a uniform dough batch having a finished weight of 1,000 lb. For example: Establish as a standard a dough batch weighing 1,000 lb. when entering the oven and having the following ingredients:

Flour	584.0 lb.*
Water	350.0 lb.
Salt	10.6 lb.
Sugar	13.2 lb.
Malt	6.0 lb.
Yeast	11.5 lb.
Shortening	11.5 lb.
Milk	13.2 lb.
Total	1,000.0 lb.

*12 per cent water content.

The calculated specific heat of this dough is 0.637, but this should be determined more accurately by experiment. In the subsequent discussion the specific heat is taken to be 0.64, which is about average for the usual dough batches.

Before determining efficiencies it will be necessary to calculate the number of B.t.u. required to bake this dough batch entering the oven at a temperature of 90 deg. F. For this calculation the following assumptions are made:

1. The crust shall be taken as 7 per cent of the weight of the bread batch, with a corresponding specific heat of 0.55.
2. Shrinkage in the oven shall be taken as 10 per cent of the weight of the dough batch.
3. The flour containing 2½ per cent sugar, together with the 1.32 per cent sugar and 0.6 per cent malt, will produce approximately 1 per cent of alcohol

The B.t.u. required to bake this batch is calculated as follows:

837 lb. crumb structure raised from 90 to 210 deg. F	837	× 120	× 0.64	=	64,300 B.t.u.
63 lb. crust structure raised from 90 to 275 deg. F	63	× 185	× 0.55	=	6,400 B.t.u.
90 lb. water raised from 90 to 212 deg. F	90	× 122	× 1	=	11,000 B.t.u.
90 lb. water evaporated at 970 B.t.u. per lb	90	× 970		=	87,300 B.t.u.
10 lb. alcohol raised from 90 to 172 deg. F	10	× 82	× 0.547	=	448 B.t.u.
10 lb. alcohol evaporated at 372 B.t.u. per lb	10	× 372		=	3,720 B.t.u.
To raise water vapor from 212 to 450 deg. F	90	× 238	× 0.46	=	9,860 B.t.u.
To raise alcohol vapor from 172 to 450 deg. F	10	× 278	× 0.31	=	862 B.t.u.
					183,890 B.t.u.

From this calculation, which has taken all possible heat requirement into account, one may see that it does not require more than 183,890 B.t.u. to bake the 1,000-lb. batch of dough with a shrinkage of 10 per cent in the oven, producing 900 lb. of bread.

With this figure it is possible to calculate the over-all fuel efficiency. Assuming that the oven uses 4 gal. of fuel oil per 1,000 lb. of dough baked, and assuming the fuel oil to have a calorific value of 19,000 B.t.u. per pound, the oven will use $4 \times 8.1 \times 19{,}000 = 615{,}000$ B.t.u.

The over-all fuel efficiency in this case:

$$\frac{183{,}890}{615{,}000} \times 100 = 29.9 \text{ per cent}$$

The oven efficiency:

$$\frac{900 \text{ lb.}}{1{,}000 \text{ lb.}} = 90 \text{ per cent}$$

The amount of heat required to bake 1,000 lb. of the same dough with 6 per cent oven shrinkage figures as follows:

874 lb. crumb structure raised from 90 to 210 deg. F	874	× 120	× 0.64	=	67,200 B.t.u.
66 lb. crust structure raised from 90 to 275 deg. F	66	× 185	× 0.55	=	6,700 B.t.u.
50 lb. water raised from 90 to 212 deg. F	50	× 122	× 1	=	6,100 B.t.u.
50 lb. water evaporated at 970 B.t.u. per lb	50	× 970		=	48,500 B.t.u.
10 lb. alcohol raised from 90 to 172 deg. F	10	× 82	× 0.547	=	448 B.t.u.
10 lb. alcohol evaporated at 372 B.t.u. per lb	10	× 372		=	3,720 B.t.u.
To raise water vapor from 212 to 450 deg. F	50	× 238	× 0.46	=	5,470 B.t.u.
To raise alcohol vapor from 172 to 450 deg. F	10	× 278	× 0.31	=	862 B.t.u.
					139,000 B.t.u.

The amount of heat required to bake 1,000 lb. of dough with a shrinkage of 6 per cent in the oven, producing 940 lb. of bread, is 139,000 B.t.u.

Assuming a furnace efficiency equal to that in the first example, the quantity of fuel oil burned in this case will be:

$$\frac{139{,}000}{183{,}000} \times 4 = 3.04 \text{ gal. per 1,000 lb. of dough entering the oven.}$$

In that case the oven efficiency will be:

$$\frac{940}{1{,}000} \times 100 = 94 \text{ per cent.}$$

At first glance this increase of 4 per cent in oven efficiency does not seem very large, but the baker will realize its importance immediately. For a daily output of 100,000 lb. of dough means a daily saving of 4,000 lb. of product and a fuel saving of 96 lb. of oil per day. The baker will appreciate at once which of the two savings is more important.

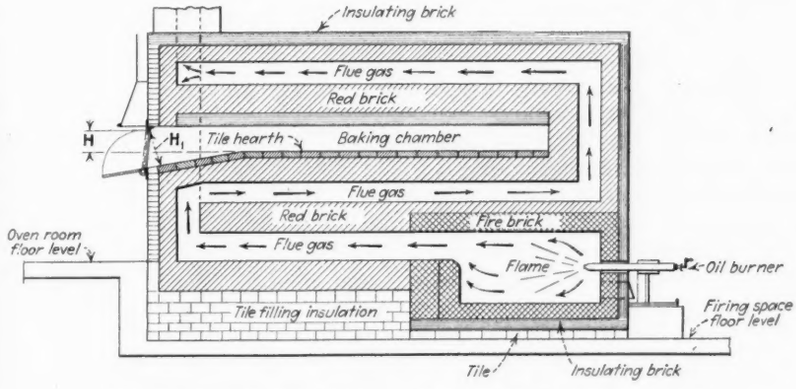


Fig. 1—Longitudinal Section of Incline-Front Hearth Oven

By the elimination of air infiltration into the oven, greater savings may be made in both fuel consumption and oven shrinkage. The amount of these savings and the method in which they may be accomplished will be discussed in later contributions. Further saving may be made by the recovery from the oven atmosphere of byproducts which are wasted in all existing ovens.

To understand and appreciate the latter savings it will be necessary to describe fully different types of oven construction together with the progress made in oven construction and present-day oven operation. This discussion will include only ovens of the indirect-fired type rather than the direct-fired gas-burning type.

The first type of oven covered will be the indirect-fired, brick-constructed peel oven, the oven to which the baking industry owes its entire growth and success. During this growth the bakers were concerned more with competition in quality than with competition in price and ballyhoo advertising which has characterized the baking industry the past few years.

The oven illustrated in Fig. 1 is one of the oldest type of peel ovens, of which several are in continuous use today in the leading bakeries. The advantage of this type of oven over several of the other types lies in that the inclined part of the hearth in front of the loading door reduces the amount of air infiltration into the oven during the loading and unloading periods. Whether or not the inventor had this object in mind I do not know.

If the oven were built so that the distance H (Fig. 1) were reduced to zero, the hot oven atmosphere would be entirely trapped within the baking chamber. Obviously this type of oven construction is impractical, as it would be impossible to load and unload the oven. The expert oven man is able to get along with a smaller distance H, and this distance usually is selected by the owner. All points considered, this type of oven is troublesome to load and unload and is appreciated only by a few who understand the function of the incline in front of the oven mouth.

An expert may load this type of oven in four or five minutes, but a routine worker more than likely will require an average of six minutes. The unloading time averages about the same. Assuming the width of the oven mouth to be 4 ft. 6 in. (54 in.), the area through which the air of infiltration may pass in and out of the oven during the loading and unloading periods is 54 in. $\times$ H. As the same quantity of air enters the oven as leaves the oven, we may calculate fairly accurately the amount of air infiltration in this type of oven.

The air enters the oven at 90 deg. F.
The air leaves the oven at 300 deg. F.
The last value must be assumed first and checked later
Weight of air at 90 deg. F. = 0.07222 lb. per cu.ft.
Weight of air at 300 deg. F. = 0.05222 lb. per cu.ft.
Difference = 0.02000 lb. per cu.ft.
Stack height = H = 9 in. = 0.75 ft.

$$\text{Draft in inches of water} = \frac{0.02 \times 0.75}{5.193} = 0.09289 \text{ in.} = h_1$$

$$\text{Velocity in ft. per min.} = V = 60\sqrt{2gh_1\frac{d}{12W}}$$

$= 4081\sqrt{h_1} = 220$ ft. per min. for dry air at 90 deg. F. and 29.92 in. barometer
g = acceleration due to gravity in ft. per sec.
h_1 = head expressed in inches of water
d = density of water
W = weight of air in lb. per cu.ft.

The inflow and the outflow depths are proportional to the relative volumes of 90 deg. F. and 300 deg. F. air, which are

$$\frac{1.038}{1.038 + 1.434} = \frac{1.038}{2.472} = 42 \text{ per cent of H for}$$

inflow and 58 per cent of H for outflow (vol. of air a t 75 deg. F. taken as 1.0).

$$\text{Area of inflow} = \frac{H_1 \times \% \text{ of } H \times \text{Width of oven}}{144 \text{ sq. in.}} = \frac{16 \text{ in.} \times 0.42 \times 54 \text{ in.}}{144} = 2.52 \text{ sq.ft.}$$

Vo ume of air entering the oven per minute = 220 ft. per min. $\times$ 2.52 sq.ft. = 555 cu.ft.

$$\text{Weight} = \frac{555}{13.7} = 40.5 \text{ lb. of air per min.}$$

Heat loss = Wt. of air per min. $\times$ specific heat of air $\times$ range of temperature = 40.5 lb. $\times$ 0.2415 $\times$ 210 deg. F. = 2060 B.t.u. per min.

A check on the above assumption of 300 deg. F. air leaving the oven must be made to determine whether the hearth is able to give up this number of heat units.

The area of top, bottom, sides, and ends of the baking chamber is 325 sq.ft.
The average wall temperature during a loading and unlcading period of 10 min. is 400 deg. F. at the surface, which is 860 deg. F. absolute temperature (T_1). The average air temperature = 195 deg. F. = 655 deg. F. absolute temperature (T_2).

$$\text{Heat of radiation} = C\left[\left(\frac{T_1}{100}\right)^4 - \left(\frac{T_2}{100}\right)^4\right] =$$

$$0.105 \text{ B.t.u.}\left[\left(\frac{860 \text{ deg. F.}}{100}\right)^4 - \left(\frac{655 \text{ deg. F}}{100}\right)^4\right]$$

$= 380$ B.t.u. per sq.ft. per hr.
C = heat radiation constant, which in the case of brick is 0.105 B.t.u. per sq.ft. of radiating surface.

$$\text{B.t.u. per min.} = \frac{325 \text{ sq.ft.} \times 380 \text{ B.t.u. per sq.ft. per hr.}}{60 \text{ min. per hr.}} =$$

2050 B.t.u. per min. dissipated by radiation.

To this figure should be added the heat of convection and from it subtracted the heat of radiation passing through the door opening. As the heat of convection and heat of radiation through the door opening nearly balance, we find that the heat lost by air infiltration checks with the heat dissipated in the oven. Thus our assumption of 300 deg. F. air leaving the oven and also the amount of air infiltration calculated are both correct.

It is not the amount of heat lost from the oven during loading and un-

loading which concerns the baker, for in six minutes this amounts to only 6 × 2,050 B.t.u. per min. = 12,300 B.t.u. However, the drying effect of this air when being heated in the oven does greatly concern him.

Drying Harmful to Product

Drying may be defined as the removal of moisture from a product, and may require from minutes to days to accomplish the result. Drying may be most effectively accomplished by moving heated air over the product.

Drying is accomplished also by direct radiation, as in the oven baking chamber when vapor is boiled from the load under atmospheric pressure and 212 deg. F. This latter drying loss is unavoidable and is absolutely necessary for the formation of an impervious crust on the dough loaves.

The drying loss caused by the air infiltration during loading and unloading periods is very harmful to the product and it is this loss which may be avoided. Let us picture 360 loaves of bread on a proofing rack leaving the proof box under the proper conditions, so that the exposed surface of the loaves is moist but not sticky. By the time the rack has been conveyed to the oven front, one may already detect a change in the texture of the dough surface, and the last loaf taken from the rack has a decided crust.

If one could examine the first loaf placed in the oven after the oven has been loaded he would find that this loaf has a much thicker skin on the exposed surface than the last loaf placed in the oven, because this first loaf has been subjected to a severe drying action by the air of infiltration.

After all dough loaves have been placed in the oven, the door is closed and steam is injected into the oven for the following two reasons:

First, the steam restores the surface of the dough loaf to a moist, elastic condition to allow for proper dough-loaf expansion, which stops at a temperature of about 167 deg. F. — the thermal death point of the yeast.

Second, the steam removes the "flash heat," which really is the overheated condition, from the oven hearth; in other words, the steam being cooler than the oven lowers the oven temperature and retards the formation of the crust surface. Should the crust surface form too soon, dough loaf expansion would be retarded and limited, with the result that the loaf would break due to formation of steam within the loaf.

The steam also assists to gelatinize the starch in the exposed surface of the dough loaf. The steam used for these operations should be saturated or slightly wet, and should be introduced into the oven at a pressure slightly above atmospheric. During this time the baking chamber is filled with a gaseous fluid consisting of superheated steam, carbon dioxide, and, after the boiling point of alcohol is reached, with alcohol vapor.

Steam is introduced into the oven for about 12 to 15 minutes and then cut off. By this time the loaf surface has reached the evaporation temperature of water, and the baking process is continued by increasing the oven temperature for another 15 minutes. The vapor in the baking chamber is now produced by evaporation from the dough loaves.

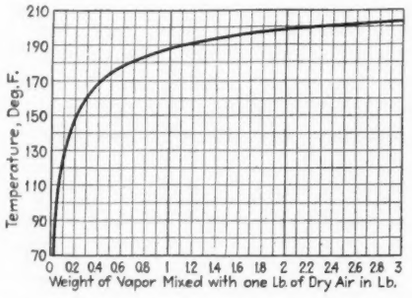


Fig. 2—Ratio of Weight of Water Vapor to Weight of Dry Air

During this time the crust is formed by the evaporation of moisture from the entire surface of the dough loaf, and the crust temperature is raised to caramelize the sugar properly in the crust surface. It may be stated here that the color of the crust depends largely upon the kind of sugar used and the quantity present in the dough.

Reason for Tight Ovens

If the oven is properly operated and the steam dampers, if any, are steamtight, the bread will have a delicate, golden brown crust which will preserve the flavor and aroma present in good-quality bread. Also, in the baking of high-class Vienna or French bread, any desired steam finish may be obtained by filling the oven with the proper quantity of steam, and, if these conditions are maintained, the crust developed will be crisp and tender.

If the oven hearth is perfectly steamtight and the bread is baked in the superheated vapor generated by the product itself, a much higher oven temperature may be maintained, which results in a shorter baking time for the formation of the crust. The shrinkage in the oven under these conditions will also be proportionately less. When an oven hearth becomes old and leaky, the quality of the product is reduced, and the bread crust becomes hard and scaly. A good oven may develop defects so gradually that the baker does not detect a reduction in the quality of his product until his trade has fallen considerably.

Although it is essential to have the proper dough mixer to develop the gluten and provide maximum absorption and also good molding and proofing equipment, it is, after all, the oven selection which contributes most toward the success or failure of a bakery. Referring again to Fig. 1, and remembering the foregoing discussion, one will note that the larger the distance *H* and the wider the door opening into the oven become the greater will be the air infiltration into the oven.

Baking or Drying?

Referring to the graph in Fig. 2, note the quantity of water vapor which may be carried away by 1 lb. of air at various temperatures and under atmospheric pressure.

Quantity of water vapor per pound of air at 70 deg. F. = 0.0178 lb.
Quantity of water vapor per pound of air at 202 deg. F. = 2.802 lb.

Just stop to think and study the condition which exists when an oven is being loaded and see what an efficient momentary dryer this oven really is. Notwithstanding, this type of oven built the baking industry to a state of prosperity and produced the highest quality product obtainable. If properly designed, and operated with the more modern heating systems such as indirect steampipe or electric heating devices, and if perfectly steamtight, almost any desired temperature and oven-vapor condition may be maintained in this type of oven, and the best possible bakery products produced.

In the next contribution we will continue with a discussion of continuous bake ovens. In developing these ovens the builders have tried to duplicate the performance of the most perfect hearth oven by endeavoring to maintain a similar gaseous fluid state in the baking chamber and an over-all performance. Here we shall show how they have failed utterly to accomplish this result and what beautiful continuous dryers they have turned out.

One builder states that he can turn out just as good a product in his oven as in any old hearth oven, which is correct, just as good a product as in any *old* leaky hearth oven.

Slashing Fuel Costs

In Plant Modernization

When J. B. Carr Biscuit Co. decided to install a 140-ft. oven, future gas bills loomed discouragingly large; but low-priced coal was available, and a gas producer was brought to the rescue

By J. B. CARR
President and General Manager
J. B. Carr Biscuit Co.
Wilkes-Barre, Pa

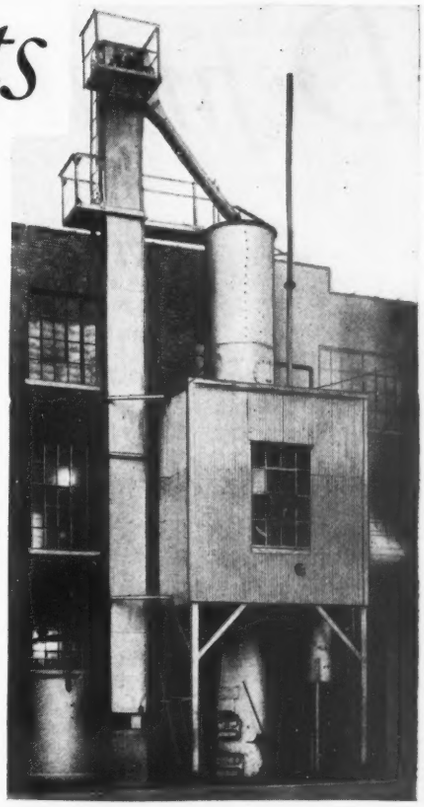
NOT every food company is fortunate enough to have a coal mine at its back door, but the J. B. Carr Biscuit Co., Wilkes-Barre, Pa., has virtually that. And by taking advantage of this opportunity, it now obtains gas for baking at a cost which is only 25 to 33 per cent of the charge for city gas.

As part of a recent $100,000 modernization program, the Evergood Bakers installed an anthracite gas producer at a cost of $7,500. This gas generator turns out the equivalent of 4,000 to 5,000 cu.ft. of city gas per hour. And the cost of the fuel amounts to only 20 or 25 cents per 1,000 cu.ft. of city gas equivalent, including coal, labor, depreciation, interest, maintenance, power, water and the rest of it. With the plant operating at 50 per cent of capacity, the company saves something like $30 a day, or $9,000 a year, by making its own gas instead of taking it from the municipal mains—not a bad return on a $7,500 investment.

Not only is the producer gas inexpensive but it is a clean fuel well adapted to heating bake ovens. Its constituent elements consist almost entirely of carbon monoxide, carbon dioxide, free hydrogen and a small percentage of methane, giving properties of a typical commercial gas. The low-flame intensity of the producer gas prevents the application of too much heat near the burners and too little at remote points, insuring close temperature maintenance.

An important factor in the difference in cost between producer and city gas at the Carr bakery is the low cost of the anthracite coal from which it is generated. Being at Wilkes-Barre, the plant is in the heart of America's great anthracite district. Thus situated, it purchases No. 1 buckwheat coal for $4 to $4.50 a ton and No. 2, rice, for $2.50 to $3. These are direct-from-the-mine costs, but they include charges for trucking the coal a mile or two from the mines to the plant.

While the gas producer is perhaps the outstanding installation in the new plant, it is by no means the entire story. Of major importance to the Evergood Bakers' new production schedule, which calls for a large output of fancy English cookies, is a new 140-ft. steel-band oven with a capacity of 1½ tons of biscuits an hour. Fired by gas from the producer and equipped with semi-automatic controls, the oven affords close regulation of its 600-deg. F. heat, a vital factor in baking the fancy biscuits to the proper crispness and color.

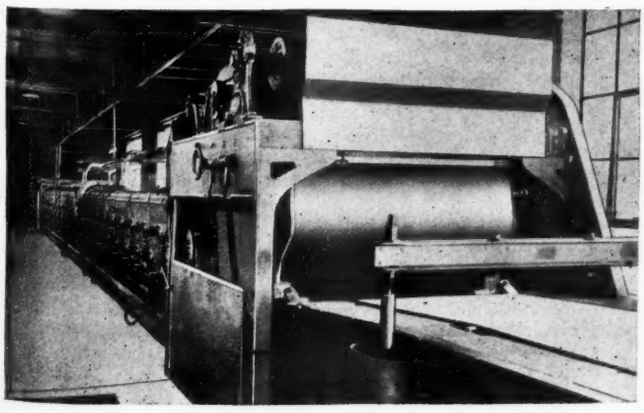


By producing its own gas, J. B. Carr Biscuit Co. has capitalized upon its location in the anthracite district. The cost of the producer was $7,500, but the savings amount to about $9,000 yearly.

Operating in conjunction with the huge oven are a wide-type continuous embossing and cutting machine, a unit that cream-fills and sandwiches more than 1,000 lb. of cookies an hour, a sugar pulverizer and new conveying equipment.

One interesting addition has been made outside the plant. For service on long hauls to distant markets the company is operating a diesel truck which is expected to average 12 to 14 miles on a gallon of fuel that costs only 6 or 7 cents a gallon. The truck carries 15,000 lb. of biscuits and its 83-hp. motor will drive it at a top speed of about 45 miles an hour.

The J. B. Carr Co. modernization has almost tripled the capacity of the plant, has improved the product and has made possible the production of several new cookies of the embossed English variety. This recent plant addition is one of several that have taken place since the first J. B. Carr established the bakery 64 years ago.



This 140-ft. steel-band oven is fired with gas generated at the plant. It bakes 1½ tons of fancy English cookies an hour.

Definitions and Standards

*FOR FOOD PRODUCTS**

The following definitions and standards for food products have been adopted as a guide for the officials of this department in enforcing the food and drugs act. These definitions and standards include those published in S. R. A., F. D. 2, revision 3, and those adopted May 12, 1933.

HENRY A. WALLACE, *Secretary of Agriculture,*
WASHINGTON, D. C., Aug. 1, 1933

THESE DEFINITIONS are so framed as to exclude substances not mentioned in the definition and in each instance imply that the product is clean and sound.

II. VEGETABLE PRODUCTS

F. Tea, Coffee, and Cacao Products

c. CACAO PRODUCTS

1. Cacao beans, cocoa beans, are the seeds of trees belonging to the genus Theobroma, especially those of *Theobroma cacao* L. and closely related species.

2. Cacao nibs, cocoa nibs, "cracked cocoa," are roasted or dried cacao beans, broken and freed from germ and from shell or husk.

3. Cacao butter, cocoa butter (see Edible Vegetable Oils and Fats).

4. Chocolate, plain chocolate, bitter chocolate, chocolate liquor, chocolate paste, bitter chocolate coating, is the solid or plastic mass obtained by grinding cacao nibs, and contains not less than 50 per cent of cacao fat and, on the moisture- and fat-free basis, not more than 8 per cent of total ash, not more than 0.4 per cent of ash insoluble in hydrochloric acid, and not more than 7 per cent of crude fiber.

5. Sweet chocolate, sweet chocolate coating, is chocolate mixed with sugar and/or dextrose, with or without the addition of cacao butter, spices, or other flavoring materials, and contains, on the moisture-, sugar-, and fat-free basis, no greater percentage of total ash, ash insoluble in hydrochloric acid, or crude fiber, respectively, than is found in moisture- and fat-free chocolate.

6. Milk chocolate, sweet milk chocolate, is the product obtained by grinding chocolate with sugar and/or dextrose. with the solids of whole milk, or the constituents of milk solids in proportions normal for whole milk, and with or without cacao butter, and/or flavoring material. It contains not less than 12 per cent of milk solids.

7. Cocoa, powdered cocoa, is chocolate deprived of a portion of its fat and pulverized, and contains, on the moisture- and fat-free basis, no greater percentage of total ash, ash insoluble in hydrochloric acid, or crude fiber, respectively, than is found in moisture- and fat-free chocolate.

8. "Breakfast cocoa" is cocoa which contains not less than 22 per cent of cacao fat.

9. Sweet cocoa, sweetened cocoa, is cocoa mixed with sugar and/or dextrose, and contains not more than 65 per cent of total sugars in the finished product, and, on the moisture-, sugar-, and fat-free basis, no greater percentage of total ash, ash insoluble in hydrochloric acid, or crude fiber, respectively, than is found in moisture- and fat-free chocolate.

10. Sweet milk cocoa is the product obtained by grinding cocoa with sugar and/or dextrose, with the solids of whole milk, or the constituents of milk solids in proportions normal for whole milk, and with or without flavoring material. It contains not less than 12 per cent of milk solids.

11. Dutch-process chocolate, "alkalized chocolate," and Dutch-process cocoa, "alkalized cocoa," are modifications, respectively, of chocolate and cocoa, in that in their manufacture an alkali carbonate or other suitable alkaline substance has been employed. In the preparation of these products not more than 3 parts by weight of potassium carbonate, or the neutralizing equivalent thereof in other alkaline substance, are added to each 100 parts by weight of cacao nibs. The finished products conform to the standards for chocolate and cocoa, respectively, due allowance being made for the kind and amount of alkaline substance added.

G. Beverages

a. CARBONATED BEVERAGES AND BEVERAGE FLAVORS

1. Ginger ale is the carbonated beverage prepared from ginger ale flavor, harmless organic acid, potable water, and a syrup of one or more of the following: Sugar, invert sugar, dextrose; with or without the addition of caramel color.

1*a*. Ginger ale flavor, ginger ale concentrate, is the beverage flavor in which ginger is the essential constituent, with or without aromatic and pungent ingredients, citrus oils, fruit juices, and caramel color.

2. Sarsaparilla is the carbonated beverage prepared from sarsaparilla flavor, potable water and a syrup of one or more of the following: Sugar, invert sugar, dextrose; with or without harmless organic acid, and with or without the addition of caramel color.

2*a*. Sarsaparilla flavor is the beverage flavor prepared from oil of sassafras and methyl salicylate (or oil of wintergreen or oil of sweet birch) with or without other aromatic and flavoring substances and caramel color. It derives its characteristic flavor from oil of sassafras and methyl salicylate.

3. Root beer is the carbonated beverage prepared from root beer flavor,

*Revision 4, Service and Regulatory Announcements, Food and Drug, No. 2, issued August, 1933, by Food and Drug Administration, U. S. Department of Agriculture.

potable water, and a syrup of one or more of the following: Sugar, invert sugar, dextrose; with or without harmless organic acid, and with or without the addition of caramel color.

3*a*. Root beer flavor, root beer concentrate, is the beverage flavor in which oil of sassafras and methyl salicylate (or oil of wintergreen or oil of sweet birch) are the principal flavoring constituents, and contains other flavoring substances, with or without the addition of caramel color.

4. Birch beer is the carbonated beverage prepared from birch beer flavor, potable water, and a syrup of one or more of the following: Sugar, invert sugar, dextrose; with or without harmless organic acid, and with or without the addition of caramel color.

4*a*. Birch-beer flavor, birch-beer concentrate, is the beverage flavor in which methyl salicylate (or oil of sweet birch or oil of wintergreen) and oil of sassafras are the principal flavoring constituents, with or without other flavoring substances, and with or without caramel color. The flavor of methyl salicylate predominates.

5. Cream soda water, "cream soda," is the carbonated beverage prepared from cream soda water flavor, potable water, and a syrup of one or more of the following: Sugar, invert sugar, dextrose, with or without harmless organic acid, and with or without the addition of caramel color.

5a. Cream soda water flavor, cream soda water concentrate, is the beverage flavor prepared from vanilla, tonka, vanillin, or coumarin, singly or in combination, together with other flavoring substances; with or without the addition of caramel color.

H. Wines

1. Wine is the product made by the normal alcoholic fermentation of the juice of sound ripe grapes, and the usual cellar treatment, and contains not less than 7 per cent nor more than 16 per cent of alcohol, by volume, and, in 100 cubic centimeters (20 deg. C.), not more than 0.1 gram of sodium chloride nor more than 0.2 gram of potassium sulphate; and for red wine not more than 0.14 gram, and for white wine not more than 0.12 gram of volatile acids produced by fermentation and calculated as acetic acid. Red wine is wine containing the red coloring matter of the skins of grapes. White wine is wine made from white grapes or the expressed fresh juice of other grapes.

2. Dry wine is wine in which the fermentation of the sugars is practically complete, and which contains, in 100 cubic centimeters (20 deg. C.), less than 1 gram of sugars and for dry red wine not less than 0.16 gram of grape ash and not less than 1.6 grams of sugar-free grape solids, and for dry white wine not less than 0.13 gram of grape ash and not less than 1.4 grams of sugar-free grape solids.

3. Fortified dry wine is dry wine to which brandy has been added but which conforms in all other particulars to the standard of dry wine.

4. Sweet wine is wine in which the alcoholic fermentation has been arrested and which contains, in 100 cubic centimeters (20 deg. C.), not less than 1 gram of sugars, and for sweet red wine not less than 0.16 gram of grape ash, and for sweet white wine not less than 0.13 gram of grape ash.

5. Fortified sweet wine is sweet wine to which wine spirits have been added. By act of Congress, "sweet wine" used for making fortified sweet wine and "wine spirits" used for such fortification are defined as follows (sec. 43, act of Oct. 1, 1890, 26 Stat. 621; as amended by sec. 68, act of Aug. 27, 1894, 28 Stat. 568; as amended by sec. 1, act of June 7, 1906, 34 Stat. 215; as amended by sec. 2, act of Oct. 22, 1914, 38 Stat. 747; as amended by sec. 402 (c), act of Sept. 8, 1916, 39 Stat. 785; and as further amended by sec. 617, act of Feb. 24, 1919, 40 Stat. 1111):

That the wine spirits mentioned in sec. 42 is the product resulting from the distillation of fermented grape juice, to which water may have been added prior to, during, or after fermentation, for the sole purpose of facilitating the fermentation and economical distillation thereof, and shall be held to include the product from grapes or their residues commonly known as grape brandy, and shall include commercial grape brandy which may have been colored with burnt sugar or caramel; and the pure sweet wine which may be fortified with wine spirits under the provisions of this act is fermented or partially fermented grape juice only, with the usual cellar treatment, and shall contain no other substance whatever introduced before, at the time of, or after fermentation, except as herein expressly provided: *Provided,* That the addition of pure boiled or condensed grape must or pure crystallized cane or beet sugar, or pure dextrose sugar containing, respectively, not less than 95 per centum of actual sugar, calculated on a dry basis, or water, or any or all of them, to the pure grape juice before fermentation, or to the fermented product of such grape juice, or to both, prior to the fortification herein provided for, either for the purpose of perfecting sweet wines according to commercial standards or for mechanical purposes, shall not be excluded by the definition of pure sweet wine aforesaid: *Provided, however,* That the cane or beet sugar, or pure dextrose sugar added for sweetening purposes shall not be in excess of 11 per centum of the weight of the wine to be fortified: *And provided further,* That the addition of water herein authorized shall be under such regulations as the Commissioner of Internal Revenue, with the approval of the Secretary of the Treasury, may from time to time prescribe: *Provided, however,* That records kept in accordance with such regulations as to the percentage of saccharine, acid, alcoholic, and added water content of the wine offered for fortification shall be open to inspection by any official of the Department of Agriculture thereto duly authorized by the Secretary of Agriculture; but in no case shall such wines to which water has been added be eligible for fortification under the provisions of this act, where the same, after fermentation and before fortification, have an alcoholic strength of less than 5 per centum of their volume.

6. Sparkling wine is wine in which the after part of the fermentation is completed in the bottle, the sediment being disgorged and its place supplied by wine or sugar liquor and/or dextrose liquor, and which contains, in 100 cubic centimeters (20 deg. C.), not less than 0.12 gram of grape ash.

7. Modified wine, ameliorated wine, corrected wine, is the product made by the alcoholic fermentation, with the usual cellar treatment, of a mixture of the juice of sound, ripe grapes with sugar and/or dextrose, or a syrup containing not less than 65 per cent of these sugars, and in quantity not more than enough to raise the alcoholic strength

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● The specifications published in this issue complete the list that has been adopted or recommended for adoption under the authority of the Federal Food and Drug Act of 1906. Sections of this compilation have been published monthly by FOOD INDUSTRIES since January, 1934.

● Study them and see if they can be improved and that they cover the foods you manufacture. Make your recommendations to the Food Standards Committee of the Department of Agriculture.

● A new food and drug law during this Congress appears highly doubtful. However, it is well for every food manufacturer to be prepared for what may take place during the next Congress. He should be prepared to take a hand in the formulating of definitions and standards for the foods he does or may want to manufacture.

● Copies of these definitions and standards can be obtained from the Department of Agriculture. Address your request to W. S. Frisbie, Chairman, Food Standards Committee, Food and Drug Administration, U. S. Department of Agriculture, Washington, D. C.—Editor.

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after fermentation to 11 per cent by volume.

I. Vinegars

1. Vinegar, cider vinegar, apple vinegar, is the product made by the alcoholic and subsequent acetous fermentations of the juice of apples, and contains, in 100 cubic centimeters (20 deg. C.), not less than 4 grams of acetic acid.

2. Wine vinegar, grape vinegar, is the product made by the alcoholic and subsequent acetous fermentations of the juice of grapes, and contains, in 100 cubic centimeters (20 deg. C.), not less than 4 grams of acetic acid.

3. Malt vinegar is the product made by the alcoholic and subsequent acetous fermentations, without distillation, of an infusion of barley malt or cereals whose starch has been converted by malt, and contains, in 100 cubic centimeters (20 deg. C.), not less than 4 grams of acetic acid.

4. Sugar vinegar is the product made by the alcoholic and subsequent acetous fermentations of sugar syrup, molasses, or refiner's syrup, and contains, in 100 cubic centimeters (20 deg. C.), not less than 4 grams of acetic acid.

5. Glucose vinegar is the product made by the alcoholic and subsequent acetous fermentations of a solution of glucose, is dextrorotatory, and contains, in 100 cubic centimeters (20 deg. C.), not less than 4 grams of acetic acid.

6. Spirit vinegar, distilled vinegar, grain vinegar, is the product made by the acetous fermentation of dilute distilled alcohol, and contains, in 100 cubic centimeters (20 deg. C.), not less than 4 grams of acetic acid.

III. SALT

Table salt, dairy salt, is fine-grained crystalline salt containing, on a water-free basis, not more than 1.4 per cent of calcium sulphate ($CaSO_4$), not more than 0.5 per cent of calcium and magnesium chlorides ($CaCl_2$ and $MgCl_2$), nor more than 0.1 per cent of matters insoluble in water.

Pending further announcement, no exception will be taken by the Food and Drug Administration to table salt that meets the requirements of the standard except that it contains anhydrous calcium sulphate (anhydrite) in excess of 0.1 per cent, provided that the total calcium sulphate content does not exceed 1.4 per cent.

IV. BAKING POWDER

Baking powder is the leavening agent produced by the mixing of an acid-reacting material and sodium bicarbonate, with or without starch or flour.

It yields not less than 12 per cent of available carbon dioxide.

The acid-reacting materials in baking powder are: (1) Tartaric acid or its acid salts, (2) acid salts of phosphoric acid, (3) compounds of aluminum, or (4) any combination in substantial proportions of the foregoing.

On April 24, 1933, the U. S. Food Standards Committee announced that it was considering standards for egg products.

The proposed definitions are:

LIQUID WHOLE EGGS, MIXED EGGS, is the product obtained by separating the edible portion of eggs from the shells. It is commonly a uniform mixture of the white and yolk.

FROZEN EGG is the solid product obtained by quickly and completely freezing liquid whole eggs.

DRIED EGG is the product obtained by evaporating the water from liquid whole egg. It contains not more than 7 per cent of moisture.

EGG YOLK is the product obtained by separating the whites from the yolks in the commercial process of egg-breaking. It contains not more than 12 per cent by weight of adhering white.

FROZEN EGG YOLK is the solid product obtained by quickly and completely freezing egg yolk.

DRIED EGG YOLK is the product obtained by evaporating the water from egg yolk. It contains not more than 5 per cent of moisture.

Cadmium Is Poisonous

Careful investigation of an unusual food-poisoning case reveals that the container in which the food was prepared caused the trouble

By C. R. HAZEN
Vice-President
Milton Hersey Co., Ltd.
Montreal, Canada

RESPONSIBILITY for digestional disorders or illness traceable to food is often laid at the door of the food manufacturer and frequently he has to defend his company in lawsuits involving exorbitant sums claimed for personal damages. This is true even though only on very rare occasions has it been definitely proved that the manufacturer was guilty of carelessness, negligence or ignorance that resulted in injurious effects upon the consumer of his product. It is true there have been cases in which the manufacturer was at fault, but these instances have been few.

Too often the manufacturer will allow himself to be victimized into the payment of a considerable sum of money to avoid publicity which might damage his business to an extent greater than the sum he would have to pay in private settlement of the complaint. The results obtained through the investigation of a recent instance of illness due to food poisoning illustrates the wisdom of getting at the facts of the case, regardless of what circumstantial evidence might indicate.

Two ladies made a dessert from a lemon gelatin dessert powder and poured it into an ice-cube pan in their apartment refrigerator to obtain a firm, cold jelly. They ate part of it during the evening meal. In a short time both became ill. Violent vomiting followed by diarrhea of a very watery character and dryness of the mouth and throat were the most noticeable symptoms.

The remainder of the jelly was left in the pan until the next day. By this time the two ladies had recovered. Meanwhile, not suspecting the jelly, they gave it to their charwoman for her lunch. She, too, became violently ill, manifesting the same symptoms. She remained quite sick for a week. It was then that the jelly was suspected and the trays in which the jelly had been set were taken to an analyst with a request to determine the cause of the trouble.

The jellies were made from two varieties of this gelatin dessert powder and from a gelatin. Some of each were allowed to set in glass and some in the tray. By these tests it was found that the gelatin and the dessert preparations, as well, dissolved some metallic substances from the ice-cube pan. One of the analysts ate some of the jelly from the cube pan which had been prepared in the laboratory and in 20 minutes showed unmistakable effects of the poison.

Upon examination it was found that all three lots from the pan contained the same impurities, while the same jelly set in glass did not contain any. The gelatin jelly was examined and found to contain 0.708 gram of cadmium with a trace of arsenic. It was found that the pans of this refrigerator had been repaired with a fresh coating of metal which was supposed to have been nickel. In that there was some confusion. The tins had been given by a service man to a workman who had a small coating establishment. This man followed his own devices; apparently coating the pan the easiest way he could.

The coating was scraped off and analyzed. In place of nickel or tin, the metal was found to be a mixture and a curious one at that. The composition was:

	Per Cent
Arsenic	0.09
Tin	32.31
Copper	5.22
Nickel	5.85
Cadmium	56.33

The gelatin dissolved the cadmium from this mixture, and it was to the cadmium that the poisoning was due.

Temperature... Is Not the Sole Consideration in the Frozen Pack . . . Research Reveals Effects of Other Factors on Spoilage

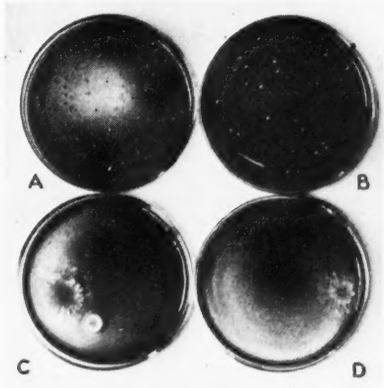
By J. A. BERRY
Frozen Pack Laboratory
Bureau of Plant Industry
Department of Agriculture
Seattle, Wash.

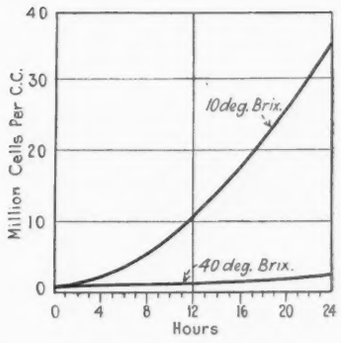
ALTHOUGH temperature is an important factor in preserving fruits and vegetables by freezing, it is by no means everything. Experience in the Frozen Pack Laboratories of the Bureau of Plant Industry, at Seattle, Wash., has shown very clearly that the decomposition of frozen packs depends in no insignificant measure upon the type of container, the acidity of the product and the nature of the packing liquor. The work at this laboratory has yielded practical information on these elements of the frozen pack.

In the matter of containers, the choice of an airtight one over the non-sealed type makes a big difference in the quality of the pack. Containers that admit air, either at the closure or through porous sides, will not "keep" the pack more than a few months at most, unless stored at a temperature below 18 deg. F., the critical temperature for mold growth. For example, a heavy growth of green mold (*Cladosporium*) repeatedly developed on strawberries and raspberries stored more than six months at 20 deg. F. in non-airtight containers, even though the berries were packed in a 50-deg. Brix syrup. And part of this same pack in sealed containers underwent marked reduction in microbial content under identical storage conditions. At 25 deg. F. the effect of the container is even more quickly apparent, green and blue molds (*Cladosporium* and *Penicillium*) developing in unsealed containers within a few weeks. A storage temperature of 28 deg. F. is worthless when the containers are not airtight. In sealed containers, however, blackberries have been kept for two years at that temperature. The chief reason for this marked influence of the type of container on spoilage lies in the fact that in the one case molds obtain the air necessary for their growth, whereas in the other they do not.

When the acidity of the frozen pack is great enough to prevent bacterial growth, as it is with small fruits such as strawberries, raspberries and loganberries, spoilage is caused by molds or yeasts which are tolerant of acid. But, fortunately for the frozen-food packer, the former require air for their development, as has already been seen, and the latter, though more or less indifferent to the air supply, do not succeed at temperatures much below freezing. For this reason, raspberries and similar acid fruits ordinarily do not spoil if packed in airtight containers and held at 25 deg. F. A non-acid product, such as peas, however, will spoil at this temperature no matter how packed. If the container be sealed, bacteria not requiring free oxygen for growth will do the damage. And where air is present, these bacteria are assisted by molds in ruining the pack. Here it should be pointed out that certain bacteria multiply much faster at 25 deg. F. than might be supposed. For instance, *Pseudomonas fluorescens*, an organism common on vegetables, has been found to increase more than 30-fold in 36 days at that temperature.

Airtight containers aid materially in preserving frozen packs. These illustrations show the microbial development on wort agar plates inoculated with 0.05 gram of frozen-pack raspberries which had been stored at 20 deg. F. for one year. A and B show growth from a non-airtight container and *C* and *D*, from an airtight one.



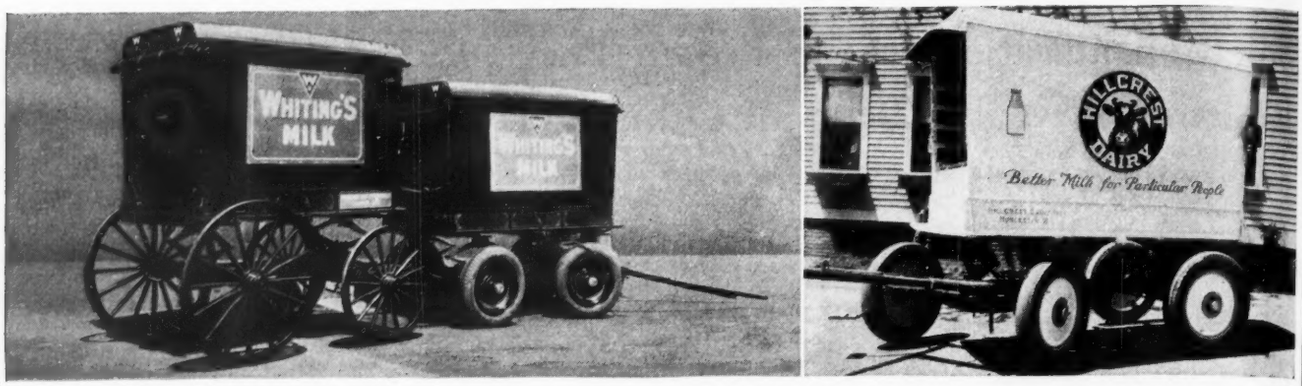


Sugar retards microbial development in the frozen pack. This chart shows what happened when syrups formed by adding different quantities of sugar to wort were inoculated with yeast cells and incubated at 60-65 deg. F. for 24 hours

The liquor in which frozen fruits and vegetables are packed exercises an important influence not only on the keeping qualities of the pack while being frozen but also on the rate at which the product goes off-color and spoils after defrosting. It is a well-known fact that strong syrups and brines delay or even prevent the growth of microorganisms; that sugar in a "2 plus 1" pack of strawberries, for example, retards the activity of molds and yeasts while the pack slowly cools to the storage temperature. It follows that such a pack when defrosted will resist spoilage longer than "straight-pack" fruit. Furthermore, the liquor will tide the pack safely over short exposures to dangerous temperatures. Of course, the quantity of sugar (either dry or as syrup) and of salt (as brine) must not exceed well-defined limits.

Microbiological spoilage does not, of course, cover everything that may happen to the frozen pack. Some quality deterioration of frozen fruits and vegetables—as in appearance, texture and palatability—is likely to occur without microbial activity in the 20- to 25-deg. F. storage temperature range. Strawberries are especially susceptible. Raspberries, on the other hand, are much less susceptible. Another point to bear in mind is that the poor quality of some frozen packs results from defects in the original product. No packing method and no choice of storage temperature, however sound, can restore desirable qualities to a product blemished by bad handling in the field or undue delay at the plant.

PNEUMATIC TIRES *for*



Contrast between the old and the new in Whiting wagons used in Boston, Mass. Over 200 of the pneumatic-tired wagons were converted to Whiting specifications by E. Teel & Co., Medford, Mass. Right, one of seven pneumatic-tired wagons of the Hillcrest Dairy, Inc., Worcester, Mass., on second-hand Dodge automobile wheels with ball bearings and second-hand tires.

Less Early-Morning Noise; Lower Wagon Upkeep and Easy Pulling in Snow Seem Positive Advantages —Further Development to Answer Other Claims

PART ONE

STILL a controversial procedure in some particulars, the fitting of pneumatic tires on retail milk-route horse wagons has progressed far enough to indicate certain definite advantages. These are the reduction of wagon noises, so annoying to light-sleeping customers in the early morning hours; a great reduction in the cost of wagon repairs and a reduced fatigue of horses working in snow.

The above summary of advantages is made as the result of replies to a questionnaire sent out by FOOD INDUSTRIES to more than 100 prominent retail milk companies throughout the United States and Canada.

It is significant that not one of the companies using pneumatic-tired wagons is dissatisfied with the results. Some companies are still experimenting. Many state that they are converting all their steel-tired wagons into pneumatic-tired vehicles as rapidly as possible.

The trend is definitely toward the pneumatic-tired milk wagon. For the same reasons as apply to the milk business, this trend may be reflected in the bread or bakery wagon and in the light wagon equipment used for the retail delivery of other food products such as groceries and meats.

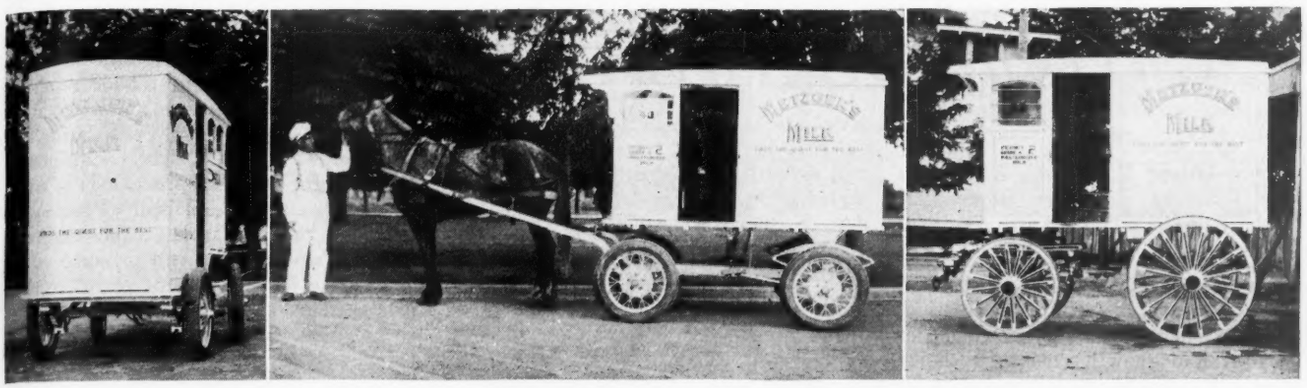
The questionnaire replies indicate a difference of opinion as to whether or not the pneumatic-tired wagon with plain, sleeve, ball or roller bearing axles pulls easier than the steel-tired wagon with the same load, and, if so, whether lighter-weight, less expensive horses may be used.

Other controversial factors include: the need for any of the anti-friction bearings in place of the plain-bearing axles; the need for brakes and the best type to employ, if any; and whether the usually lower body floor and step of the pneumatic-tired wagon permits the driver to do more work and results in fewer vehicle accidents and fewer slipping injuries.

Among other advantages mentioned are an increase in prestige or advertising value to the first company using pneumatic-tired wagons in a given community; and a reduction in bottle breakage due in part to the better

One of thirteen pneumatic-tired wagons used by Mitchell Dairy Co., Inc., Bridgeport, Conn. Regular Mitchell plain-bearing hubs are fitted into wheels furnished by the Connecticut Wheel & Rim Co., New Haven, Conn. A. W. Mitchell, president, states that the horses which pulled the pneumatic-tired wagons in last winter's snows worked seven days a week and did not lose flesh, while those pulling the steel-tired wagons worked only six days and some routes required two horses.

Retail Milk Horse Wagons



Contrast between the old and new in milk wagons as used by the Metzger Dairies in Dallas, Texas. Right, the conventional steel-tired wagon. Left and center, two of the new types, of which 25 have been put into service since 1932. Rear views at the left shows a low-bed wagon. Note the automobile-type wire wheels with roller bearing and brake drums.

cushioning of the pneumatic tires.

The survey indicated a wide range —$51 to $200—in the cost of converting a steel-tired wagon into one with pneumatic tires. Perhaps $125 to $150, or approximately one-third the cost of a new wagon, is a good average. The variation in cost is due to many factors. Usually the higher costs include new tires, complete repainting, and repairs to the wagon in addition to conversion charges. The cost is likewise affected by the type of anti-friction axle used, if any; by the use of new or second-hand automobile-type wheels or the old wheels cut down, and new or worn tires.

The first pneumatic-tired milk wagon, credited to Joseph Willmann, of the Whiting Milk Cos., Boston, Mass., was put into service over two years ago. The Whiting company now has in use more than 200 such wagons. The Whiting policy is to convert the steel-tired wagons when major repairs have to be made. Mr. Willmann writes: "I decided to use regular automobile wheels with balloon tires and roller bearings. I had a special apparatus built to measure the pull. It was proved that the initial pull on a wagon equipped with roller bearings and balloon tires is just one-half that on an old-fashioned wagon."

The Whiting wagons were all converted to Mr. Willmann's specifications at the plant of E. Teel & Co., Medford, Mass. From that experience the Teel company developed a conversion unit of its own consisting of a special hub, Timken roller-bearing axle and steel disk wheels, which may be shipped for local mounting.

The Axle Valve Co., Chicago, Ill., which manufactures a bronze sleeve bearing for standard sizes of axle spindles, supplies complete change-overs for pneumatic tires.

Mitchell Dairy Co., Bridgeport, Conn., uses plain axle bearings and believes there is no need for anti-friction bearings. From their experience, they find that horses "break down" in the rear and not in the front from innumerable sudden stops—that a wagon can roll too easily, thus putting too much strain on the horse. The viewpoints of many other users of pneumatic-tired wagons will be given in the next issue.

Top, one of the Teel pneumatic-tired wagons used by the Producers' Dairy Co., in Brockton, Mass. Above, a low-aisle wagon used by the Borden's Farm Products Co. of Michigan in Detroit, and fitted with a complete change-over of wood-spoke automobile wheels and roller-bearing axles furnished by Axle Valve Co., Chicago, Ill.

Correction: Sturges Battery Corp., 122 East 42d St., New York, N. Y., is the maker of the Sturges storage battery discussed on pp. 221 and 223, FOOD INDUSTRIES, May, 1934.

ABSTRACTS OF
Current Literature

STORING MEAT. E. Loeser. *Zeitschrift des Vereines deutscher Ingenieure,* Vol. 78, pp. 535-537; April 28, 1934.

A series of tests to control the chief causes of weight loss and spoilage in stored meat (evaporation, oxidation, aging by enzyme action, bacterial decay and mold growth) led to a choice of preferred conditions which are quite different from prevailing practice in cold-storage warehouses. As atmospheric conditions largely but not exclusively control storage results, major attention was given to the influence of temperature, humidity, and velocity of the air in the storage chamber. The preferred storage conditions are: temperature, about ±0 deg. C. (the lowest possible without freezing the meat); humidity, to prevent evaporation losses without unduly favoring bacterial growth, about 90 per cent; and air velocity, may vary a great deal but should be adequate for uniform distribution of the air.

YEAST FOR BAKING. N. N. Ivanov and Ph. L. Trainina. *Papers of the Central Biochemical Food Research Institute* (U. S. S. R.), Vol. 3, pp. 110-119; No. 20, 1933.

A dry yeast preparation, showing only 25 per cent loss in dough-raising power as compared with fresh yeast, has been successfully prepared. A top yeast with good dough-raising power was selected; was well pressed; rubbed through a wire sieve; collected in a layer 1 mm. (0.039 in.) deep; and dried 3 or 4 hours at 33 deg. C. (91 deg. F.) in a current of dry air. This preparation gave good results, both in laboratory trials and in actual bakery tests, using the prefermentation method. Storage for six months, sealed in glass, caused no loss either in fermentation activity or in dough-raising power.

CANNED MEAT. Yuzuru Okuda and Kazuo Yamafuji. *Journal of the Society of Agricultural Chemistry of Japan,* Vol. 9, p. 835, 1933; *Bulletin of the Chemical Society of Japan,* Vol. 9, pp. 75-83; February, 1934.

In an experimental study of the effects of heat, pressure, and hydrogen-ion concentration on keeping quality and other properties of canned meats and fish, tests were made with purified proteins of whale, rabbit, beef, chicken, and several kinds of fish. Heating in a sealed glass tube for 1 hour at 266-284 deg. F. caused considerable formation of soluble peptones, peptides, and amino acids. These soluble nitrogen compounds are considered responsible for rapid spoilage when canned meat is opened. Liberation of H_2S and ammonia increased as hydrogen-ion concentration decreased, and became quite copious on the alkaline side of the neutral point. Hydrogen sulphide causes blackening of canned meat, by formation of iron sulphide when the tinning of the can is not perfect; spoilage also is accelerated in such cans. According to these experiments, excessive time and temperature of heating, alkalinity of the aqueous medium, and faulty tinning of cans are conditions to be avoided in canning meats and fish.

ALUMINUM CANS. Gulbrand Lunde, Valborg Aschehoug, Hans Breien and K. Wülfert. *Tidsskrift for Hermetikindustrie,* Vol. 19, pp. 174-185.

Confirmatory experimental tests have been made with sardines, herring and fish balls to show that aluminum is a suitable material for food cans. Brisling sardines, fresh and kippered herring, crab, lobster and shrimp showed no hydrogen swells after storing for two or more years. Some hydrogen swells appeared with Sild sardines, but were traced to faulty processing prior to canning. The quantity of aluminum entering the foods from aluminum is not appreciably greater than the quantities imparted to foods by aluminum cooking utensils. Moreover, feeding tests on rats indicate that aluminum taken into the alimentary tract causes no harmful results and is quantitatively eliminated.

CITRIC ACID FROM LEMONS. Guido Ajon. *Annali di merceologia siciliana,* No. 1, 33 pp.; 1933.

The Sicilian lemon industry has found that fermentation can be successfully applied to lemon juice to convert its sugars into citric acid and in that way produce more acid than is naturally present in the juice. This is accomplished by treating the fresh juice with less than 0.1 per cent of tannic acid, stirring with 0.4 per cent of active carbon at about 158-167 deg. F. for 1 hour, cooling, filtering, inoculating with a selected strain of organisms for complete fermentation (in 8 to 15 days) of the sugars in the juice, filtering, evaporating to one-ninth the original volume, precipitating calcium and magnesium by adding ammonium oxalate, filtering after 24 hours, adding about 0.8 per cent tartaric acid, filtering after 24 hours, and finally evaporating to precipitate the citric acid. Equipment for carrying out this process on a commercial scale is described. From preliminary cost estimates it is predicted that the new method can produce citric acid at a price competitive with that produced from cheap sugar materials by the fermentation method.

RENNET IN MILK. Pericle Parisi. *Giornale di chimica industriale ed applicata,* Vol. 15, pp. 545-552; November, 1933.

To understand better the coagulating action of rennet in milk, a comprehensive investigation has been made of the factors which influence the coagulation. The process was studied in both its successive stages: conversion of the casein to a modified form and coagulation of the altered casein. Unexpectedly, the process was discovered to be governed by only two direct or primary factors: (1) hydrogen-ion concentration (pH) and (2) calcium-ion concentration. There are, however, numerous indirect or secondary factors which have influence by altering one or the other of the primary factors. Among these are dilution and partial neutralization, which cause changes in pH, and heating or adding soluble calcium salts, which change the calcium-ion concentration. The relations of these primary and secondary factors to each other present a complex picture from which it is difficult to draw exact conclusions; but much can be done toward providing the conditions leading to a desired result in milk or its products.

BUTTER AROMA. *Chemisch Weekblad,* Vol. 31, Rubriek voor Handel en Industrie, pp. 32-34; Feb. 10, 1934.

Acetylmethylcarbinol, also termed hydroxyethylmethylketone, long known chemically but never before offered for regular commercial use, is being produced on a factory scale in Holland. Its value in food manufactures lies in its close chemical relation to biacetyl, the compound which gives butter its characteristic aroma. For some purposes acetylmethylcarbinol is superior to biacetyl as an aromatizing agent, imparting its effect by a slow and regular formation of biacetyl in the treated material. Biacetyl, originally considered useful only in margarine manufacture, finds new uses for its

(Turn to page 290)

NEW BOOKS

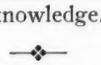
FOOD PRODUCTS, Third Edition. By Henry C. Sherman. Macmillan Co., 60 Fifth Ave., New York, N. Y., 1933. 674 + XII pp., 5¾x8; cloth; illustrated. Price, $3.

CHANGES in eating habits of American people, newer knowledge in nutrition, and developments in the economics and technology of foods have necessitated rewriting the 1924 (second) edition of Dr. Sherman's well-known and highly valuable manual on foods.

The object of this reference text is to put into one convenient and authoritative volume an account of the production and preparation for market of each type of food, including statistical data that will indicate relative importance of each industry; answer questions relative to sanitation, inspection, and standards of purity of these foods; tabulate composition, mineral content, and vitamin values; and give data regarding special characteristics, digestibility, nutritive value, and importance in diet.

Fruits and nuts, which have been growing in importance in the American dietary, are each given a chapter in this new edition. Also reference is made to the growing consciousness within and between different food industries of the need for improving and standardizing food products. Special emphasis is placed on the subject of food control in all its aspects.

Intercommodity competition, "pure" food legislation, inspection regulations, and mineral and vitamin content of foods are fully dealt with in the light of present-day knowledge.



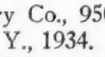
THE AMERICAN FARMER AND THE EXPORT MARKET. By Austin A. Dowell and Oscar B. Jesness. University of Minnesota Press, Minneapolis, Minn., 1934. 269 pp., 5⅞x8⅜; cloth; illustrated. Price, $2.

ONE who reads this book is led to the top of the mountain to see the Promised Land, but because the authors are scientifically trained they refuse to allow themselves the indulgence of a vision of the future and leave one very much in the same state of well-informed bewilderment as does that much discussed pamphlet, "America Must Choose." Indeed, the thought will not down that the Secretary of Agriculture, Henry A. Wallace, has more than a bowing acquaintance with Messrs. Dowell and Jesness.

The existence of agricultural surpluses is clearly recognized. The loss of our export markets for farm products also is admitted. Every possible avenue of man-made escape from our man-made problems is carefully examined. And all are abandoned save the choice of nationalism vs. internationalism, with the attendant need to adjust tariffs, international debts and consequent widespread personal adjustments.

Population growth cannot absorb the surplus because the population is becoming stationary and the corrective measure is too slow anyway. There is no hope for increased consumption, because they note there is a gradual decrease in per-capita consumption of foods. Removal of submarginal lands is shown to be hopeless, because agriculture is becoming more efficient, and shifting agriculture from export to import crops is proved to be useless.

Even if one has small interest in agricultural economic problems the volume is worth reading and owning, not only for its very realistic approach to this grave national question but because it abounds with statistics of per-capita consumption of many common foods. Its arguments and conclusions are not wholly in sympathy with Planned Economy à la New Deal, yet, reading between the lines, we are convinced that a little economic planning back in 1919 would be greatly appreciated today.—L. V. BURTON.



THE CHEMICAL FORMULARY. Vol. I. H. Bennett, editor in chief. Chemical Formulary Co., 950 Third Ave., Brooklyn, N. Y., 1934. 537 + X pp., 6x8⅞; cloth. Price, $6.

FOR ONCE a compiler of formulas admits that his collection is to be regarded as a beginning and not the ultimate of knowledge on the manufacture of the products included. The fields covered and the sources of information are so many and varied that an editorial board of 56 chemists and engineers has been employed to glean pertinent facts from literature, laboratories, manufacturing plants, and active workers to obtain the latest and best data.

To the chemist, research worker, and technical production man these formulas will serve as starting points for the working out of production ideas or of new uses for their products. Nontechnical executives will find in this volume an introduction to the products in which they may have an interest. Laymen are cautioned against trying to make practical use of these formulas without the assistance and advice of trained and technically minded men experienced in the particular field.

All formulas covered by patent are so designated that there can be no excuse for anyone using them unknowingly as an approach to a patent infringement.

Of interest to food manufacturers are the chapters dealing with Adhesives, Beverages and Flavors, Food Products, Cleaners, Polishes and Soaps, Emulsions, Insects and Rodent Destroyers, and Miscellaneous.

STATISTICAL ABSTRACT OF THE UNITED STATES 1933. U. S. Government Printing Office, Washington, D. C. 786 + XVI pp., 6¼x9¼; cloth. Price, $1.25. Purchasable from Superintendent of Documents, Washington, D. C.

DATA contained in any statistical compilation is valuable to business only as it is used to determine trends and progress and is authoritative. Prepared in the Division of Economic Research of the Department of Commerce, this annual abstract of United States statistics has come to be almost a necessity in every business office. Food manufacturers will do well to consult it when studying their markets and raw-material sources and supply.

THE MOTOR TRUCK RED BOOK DIRECTORY. F. Leslie Jacobus, Editor. Traffic Publishing Co., Inc., 100 Sixth Ave., New York, N. Y., 1933. 725 pp., 8¼x11; flexible fabrikoid. Price, $10.

FOOD MANUFACTURERS interested in motor-truck operation or who ship by truck will value this compilation of rates, laws, regulations, practices and court decisions relative to motor-truck transportation. It contains a national directory of motor-truck common carriers.

ABSTRACTS OF LITERATURE ON THE MANUFACTURE AND DISTRIBUTION OF ICE CREAM. VOL. V, 1931-1933. International Association of Ice Cream Manufacturers, Harrisburg, Pa., 1933. 118 + XIV pp., 8¾x11¼; cloth; illustrated. 24 pp. appendix. Price, $5.

FROM acidity in milk to water as an ingredient this biennial compilation covers subjects pertaining to ice cream manufacture and distribution. Prepared under the direction of A. C. Dahlberg, they represent the best published results of research and experimentation and are of lasting value. Compiling such abstracts applicable to their industries is an activity that other associations of food manufacturers could profitably sponsor.

WHAT'S ON YOUR MIND?

One Point of View

To the Editor of FOOD INDUSTRIES:

We are inclosing a check for $2 to cover one year's subscription because we are curious to know how far your supercilious egotism can lead you in the direction of destructive criticism.

Your editorials, especially in the April number, indicate that your one consuming obsession is to discredit the administration at Washington. You evidently are among those whose blindness is the more pitiful because "they will not see." You can see all the mistakes and shortcomings, but have no word of encouragement or commendation. You harp on the "undue haste" on the part of Congress and the administration at a time when the pressure is being exerted everywhere for greater speed in the recovery program. You lend encouragement to the conceit and arrogance of the selfish interests who are responsible for the very conditions from which we are now seeking relief. You seem to imagine that business could recover without any social or economic guidance from those to whom the people look for relief from exploitation and the racketeering practices of so-called Big Business, when the prevailing sentiment of the press and other intelligent leadership is that without N.R.A. and other remedial legislation we would probably now be in the midst of armed revolution and civil strife.

You should know that the "New Deal" is right and honorable in its conception and in its aims and purposes. Let your wisdom and superior intelligence be directed into channels of constructive criticism and suggestion for improvement and you will do more to promote the welfare of the business world than by misleading them in the vain hope of a return to the old standards now utterly discarded.

We represent a score or more of the leading food packers in the country, and all of them are in favor of the New Deal. Furthermore, it might surprise you to know that they are for the Tugwell idea of a food law. It is our observation that the agitation against this reform comes wholly from those who have something crooked to cover up. The square-shooter—the honest packer—has little to fear. Let's give them a break and give honorable practice in the food industry a chance.

JOHN O. KNUTSON CO.,
Per John O. Knutson,
Sioux City, Iowa.

P. S. I voted for Hoover, but I'm for Roosevelt.

And Two Others

To the Editor of FOOD INDUSTRIES:

We wish to congratulate you upon your editorial in the January issue of FOOD INDUSTRIES entitled "Hold to the Profit Motive."

This fully expresses our sentiments, and believe this is true of other industries. There ought to be more publicity given to this sort of thought than there has been. The fanaticism of the Tugwell program seems to be running way with what the public at first understood to be Roosevelt's policies.

We hope you will publish more of a similar nature.

THE ARNOLD MILLING CO.,
By A. L. Jacobson, General Manager,
Sterling, Kan.

To the Editor of FOOD INDUSTRIES:

May I thank you for the prvilege of reading your very fine editorial in the April issue of FOOD INDUSTRIES; also the privilege of looking at the very striking cartoon which you reprinted from the New York *Herald-Tribune*.

It seems to me that both agriculture and industry at this time need more than anything else to be given a chance to develop and progress along lines which have proved effective in the past, and which I believe will do more to pull them out of the present depression than anything else that can be done.

CALIFORNIA ALMOND GROWERS' EXCHANGE,
By T. C. TUCKER, Manager,
San Francisco, Calif.

—⟡—

The Problem of the Handcraft Shop

To the Editor of FOOD INDUSTRIES:

"The retail neighborhood bakers with handcraft shops are in financial difficulty due to higher cost of ingredients, processing taxes and increased labor cost due to N.R.A. The handcraft employees are skilled workers receiving the highest wages in the baking industry.

"The retail neighborhood bakers have not been able or permitted to receive reciprocal increased prices for manufactured products. The consumers' resistance to pay more for bread and bakery products is recognized and cannot be overcome. The retail neighborhood baker is in a worse condition than the farmers of the country.

"The government is assisting the farmers and contemplates increasing such assistance at the expense of the urban retail neighborhood bakers, who now are in desperate straits. It is unfair, inequitable and oppressive on the small independent merchants in the baking industry to permit the continuance of this condition.

"The following resolution was adopted at our meeting of May 10:

" 'It is unanimously

" 'Resolved, that the President of the United States and the Secretary of Agriculture be requested to obtain the repeal of the processing tax on wheat.

" 'Resolved, that the government consider and provide measures for the prompt relief of the small independent merchants in the baking industry, including exemptions from all further special taxes and increased labor costs.' "

WM. STEINMETZ,
Vice-Pres., Retail Bakers' Association of the Eastern States, Brooklyn, N. Y.

New Ways to Clarify "Sick" Wines

(Concluded from page 255)

One of the most interesting results, and in our opinion the most promising, was with Bentonite, a trade name for a clay of volcanic-ash origin. Two ounces rubbed to a smooth paste with a little of the wine and added to a barrel gave an excellent clarification and yielded a wine that was brilliant. The only objection was a sediment that did not pack tightly enough. A combination of 3 oz. of barium sulphate and 2 oz. of talc rubbed to a smooth paste with a little wine, and added to a barrel showed good results. However, objectionable barium residues might be left.

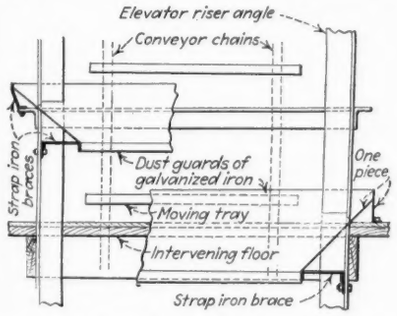
Aluminum hydroxide, as such, when added to the wine had very little effect, very probably because aluminum hydroxide is not sufficiently finely divided to inclose and drag down the colloidal particles. Precipitation of the aluminum in the wine by means of sodium carbonate and alum evidently throws down a precipitate of geater adsorptive and absortive powers. Pure silica gel, made in the laboratory by washing silicic acid precipitated by hydrochloric acid from sodium silicate, failed to manifest clearing properties. Air-floated silica also was ineffectual. In our experiments we found that the various wines react differently to different "powders." Experience and trial will show the best "powder" to use for a particular type of wine if "powders" must be used.

IDEAS . . . FROM PRACTICAL MEN

Dust Guards for Elevators

In nearly all large bakeries producing packaged goods, elevators are employed to transfer the goods from the ovens to the packing rooms. The material may go one or more floors up or down. But in either case there usually is an accumulation of mold-laden dust on the more inaccessible parts of the framework, to which are often added pieces of the baked goods that fall off the moving trays from time to time.

As one of the important objects of the elevators is to cool the material quickly, they seldom are inclosed. Usually they consist of an open framework of angle iron with innumerable ledges where dust and waste may collect. To clean these ledges frequently means considerable expense. To let the dust accumulate



and develop mold means a product of lower grade and with a shorter shelf life.

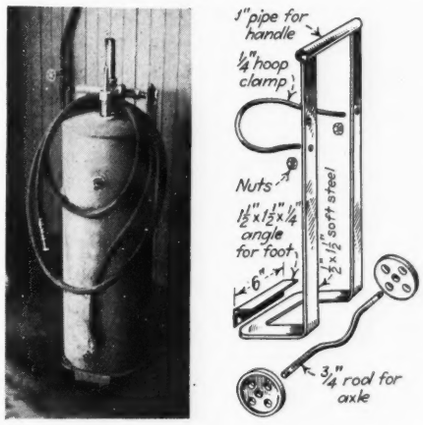
Practically any of these ledges may be covered with slanting metal guards, as shown in the accompanying sketch, thereby not only discharging the dust as it deposits but returning falling pieces to the trays. Where the supports for the guards cannot be arranged as shown, strap-iron braces extending from one riser angle to the other make a suitable support.

HARRY STINER, *New York, N. Y.*

Hand-Made Chlorine Spray

From a 3-ft. water-heater tank the plant mechanic can easily construct a compressed-air spray for applying a sterilizing solution to food-plant equipment. In a dairy plant at San Diego, Calif., such a device has greatly facilitated the treatment of glass-lined holding tanks with a chlorine rinse.

Converting the heater tank into a spraying machine requires but a few



auxiliaries. To provide an inlet for filling by funnel, a 1-in. pipe nipple with a wheel valve attached is screwed into one of the openings in the top. Into the other opening goes a capped pipe nipple tapped ⅛-in. pipe size for a reduced tire-tube valve which receives air under pressure from a tire-inflation nozzle on the air line. Connected to the bottom of the tank, through a wheel valve, is a short garden hose with a nozzle through which the rinse discharges. A compression cock in the opening near the top of the tank establishes the liquid level for filling.

To make the spray readily portable it is mounted on a two-wheel hand truck fabricated by welding. The sketch shows the parts of the truck.

BILLIE BURGAN, *San Diego, Calif.*

How to Cut Power Costs

Time allotment of plant operations, especially those requiring a large amount of power, can be made to yield substantial savings in the electric power costs where rates are based upon demand as well as energy. The ice cream division of Meadow Gold Dairies at Champaign, Ill., reduced the demand charge from 20 to 40 per cent in three months, lowered the energy charge as well and cut power costs by some $400 in one plant alone during the winter season.

The procedure was simple. Operations were rated on the basis of their total horsepower demand, motor readings being taken as the index, and those of highest consumption were scheduled at non-conflicting intervals. Where the heavy processes required a comparatively short time, or where they operated infrequently, minor processes were suspended while these big jobs were done.

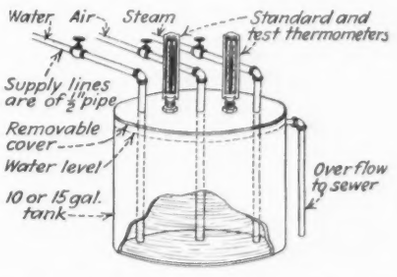
Cooling the hardening rooms and making ice took a large amount of the power, so these were largely allocated to plant shut-down periods, as at noon and night. Batch freezing required the greatest number of horsepower, but it occupied only six to eight hours weekly, and during that time all secondary operations were suspended. Viscolizing was next in order, but required only an hour a day.

Time allotment of operations is especially desirable in slack seasons. However, good judgment must be exercised to prevent the plant schedule from becoming so detailed as to cause any serious loss of efficiency.

J. O. HATHAWAY, *Champaign, Ill.*

Checking Thermometers

All thermometers and temperature controllers used in food plants should be periodically checked against standard instruments. A convenient arrangement for doing this is shown in the sketch, the instrument to be



tested and a standard one being immersed in water heated by steam and agitated by air to obtain a uniform temperature. For temperatures above 212 deg. F., a high-flash-point oil heated by a high-pressure-steam coil or an electric heater will prove effective. Mechanical agitation often takes the place of air, especially at the higher temperatures.

SAMUEL HENRY, *Sandusky, Ohio*

HOW DO *YOU* DO IT?

While the methods and mechanisms used by a production man may seem old to him, more than likely some of them are new ideas to other people. A check of operating practices may reveal something worth money to you. FOOD INDUSTRIES pays $3 and up for acceptable practical ideas.—THE EDITORS.

KEEPING UP WITH THE FIELD . . .

Industries lose interest as NRA ponders policy
Amended amendments still make Wallace dictator
Food bill bobs up and sinks under opposition
Price of taxed sugar no cause for worry
Dairymen propose plan, but Lauterbach says no
Canners' Agreements shelved by lack of signatures

Administration Policies Uncertain As Major Codes Await Action

Great uncertainty exists as to the future policy of N.R.A. toward the food industries. Of the 400-odd food groups, only a few are operating under codes and these are the smaller industries. As for the attitude of the industries themselves, it is evident that they have lost most of their interest in codes. They feel that a labor contract is about all they will get out of it.

The larger industries don't need codes so badly, for they have less trouble with chiseling than the smaller units, and to place all the smaller industries under codes becomes impractical on account of enforcement difficulties. Even N.R.A. has admitted the advisability of dropping codes for service trades and small business. Then there is the question of expense. In macaroni manufacture, for instance, there are twelve regional codes and 380 units in the industry. The expense is more than the small plants can afford. Another effect of the codes has been to promote manufacturing by retailers.

Minor Codes Approved

Looking back on the code situation for the past month reveals that several of the more important codes stand about where they were a month ago. That is, they are ready for approval but haven't quite made the grade. This is true of the master code, and those covering flour milling, canning, baking, confectionery, cocoa and chocolate, and soft drinks. Only a few minor pacts obtained approval during the month, these including spice grinding, canned salmon, blue crabs and Atlantic mackerel.

The master code, which Dame Rumor has had approved many times in the last few months, got tangled up in the question of representation of the various trade organizations. This necessitated investigation of these organizations by N.R.A. Then there are those manufacturers, notably the canners, who will have no part of a master code.

With a compromise effected between the industry and A.A.A. on the stop-loss provision, the milling code appears to be almost a reality. The stop-loss proviso to which both particles finally agreed prohibits sale below the cost of wheat (on the basis of 4.6 bu. to the barrel), minus the market price of feed, plus a figure to be determined by the code authority and not to exceed 50c. a barrel. The 50c., which is in effect an arbitrary manufacturing cost, is 5c. lower than originally proposed by the millers. The other troublesome factor, minimum wages, is expected to remain at 37½ to 45c. an hour in the North with a 5c. differential in the South. The fight to have the code transferred entirely to N.R.A. has been dropped, but it may be turned over anyway.

The canners have been unable to approve their code in the form that N.R.A. wants it. They refused to accept a brokerage clause providing that no member of the industry shall pay brokerage commission to buyers. Armin Riley, food code administrator, holds that absence of such a provision would give the canners an unfair advantage over other food manufacturers, thirteen groups having brokerage provisions.

Opposition of organized labor is one of the principal reasons why the baking industry code has not been approved. But this most probably will be overridden and the code reported favorably within a short time. Unions have held out for higher pay in spite of the $1.02 an hour wage established by the code. As Administrator Riley pointed out, unions recently settled a strike in Washington, D. C., where the industry is highly organized, on the basis of $1.

WHERE CODES STAND

APPROVED

Atlantic Mackerel	May 3	NRA
Beet Sugar (Labor Provisions)	Oct. 27	NRA
Blue Crab	May 5	NRA
Brewing	Mar. 22	NRA
California Sardine Processing	Apr. 24	NRA
Canned Salmon	May 16	NRA
Chewing Gum	Jan. 30	NRA
Coffee	Feb. 6	NRA
Fishing (Master Code)	Feb. 26	NRA
Fresh Oyster	Mar. 10	NRA
Grain Exchanges	Mar. 20	AAA, NRA
Imported Date Packing	Nov. 11	NRA
Macaroni	Jan. 29	NRA
Mayonnaise	Mar. 21	NRA
New York Live Poultry	Apr. 13	NRA, AAA
Peanut Butter	Apr. 4	NRA
Raw Peanut Milling	Jan. 12	NRA
Retail Food & Grocery Trade	Oct. 21	NRA
(Labor Provisions)	Nov. 15	NRA
Southern Rice Milling	Nov. 21	AAA
Spice Grinding	May 11	NRA
Tapioca Dry Products	Mar. 12	NRA
Wholesale Food & Grocery	Jan. 4	NRA
(Labor Provisions)	Nov. 15	NRA
Wholesale Lobster	Apr. 13	NRA

Associated Industries

Can Manufacturing	Dec. 15	NRA
Can Labelling & Can Casing Machinery	May 5	NRA
Canning & Packing Machinery	Jan. 27	NRA
Cap and Closure	Oct. 20	NRA
Carbon Dioxide (Solid)	May 5	NRA
Counter Type Ice Cream Freezers	May 5	NRA
Crown Manufacturing	Nov. 1	NRA
Fiber Can and Tube	Feb. 25	NRA
Merchandise Warehousing	Jan. 27	NRA
Milk and Ice Cream Cans	May 18	NRA
Packaging Machinery	Oct. 31	NRA
Sanitary Milk Bottle Closure	Mar. 27	NRA

HEARINGS SCHEDULED

Pickle Packing	June 6	NRA

Confectionery Codes Ready

Codes for the cocoa and chocolate and confectionery industries have reached the stage where approval is imminent. Only the mechanics of approval are holding up the cocoa and chocolate pact. The manufacturing, wholesale and retail confectionery codes were submitted for approval on May 12 and are expected to get by without much difficulty.

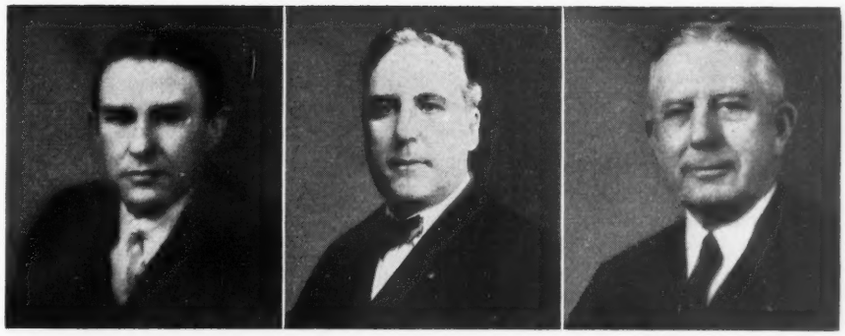
The soft drink bottlers have a code before President Roosevelt, his signature being expected before long. And ice cream manufacturers await action of the administration on their fair trade practice rules.

3,000 "Eagles" Fly Back

Alleged failure on the part of the government to carry out its part of a recovery agreement caused between 2,000 and 3,000 Empire State retail bakers to abandon their Blue Eagles May 23. This action followed adoption of a resolution by New York State Association of Retail Bakers complaining of increased production costs under the Reemployment Agreement and blaming the administration for not having approved a code to supplant this agreement. The bakers hold the American Federation of Labor largely responsible for the delay, asserting that it had publicly announced that the small handcraft baker is doomed "and ought to be doomed."

Code Improves Quality

Unwilling to chance marketability of a product labeled "below standard," practically no macaroni manufacturers are producing low-quality goods. This was pointed out by G. G. Hoskins, chairman of the code authority for the industry, as one of the principal benefits of the macaroni code. Since this code became effective more than half of the manufacturers formerly opposed to it have had a change of heart, reducing the ranks of dissenters to 4 per cent of the industry, according to Mr. Hoskins.



JOHN E. DALTON A. J. S. WEAVER CHARLES MILLER

Named associate director of the division of program planning of A.A.A., A. J. S. Weaver has turned over his duties as chief of the rice and sugar sections to two new appointees. John E. Dalton heads up sugar, and Charles Miller, rice.

Canners' Marketing Pacts On Shelf This Season

Four major marketing agreements, those for canners of corn, tomatoes, peas and cherries, appear to be definitely dead for this season. And only regional pacts seem to be making any progress.

Corn, tomato and pea canners have had tentative agreements in their hands for more than two months, but they remain reluctant to sign. A.A.A. still insists it would be to the industry's benefit to accept, as the agreements provide for collection of statistics on which the pack will be allocated under an agreement next year. Cherry canners, at a conference with A.A.A. officials early last month, decided not to have an agreement this season but to work with an informal understanding among the industry as to prices to producers.

By a marketing agreement and license effective April 28 and May 1, respectively, a system was established to regulate the volume of Florida's celery shipments in accordance with requirements. Other marketing agreement developments include a hearing on May 8 for a pact covering Georgia peaches, one on May 25 for a new pact on California cling peaches, and a third on May 28 for Irish potatoes grown in North Carolina and the Norfolk area of Virginia. A date for a hearing on agreements for Bartlett pear packers in California and in Washington and Oregon awaits approval of Secretary Wallace.

The new California cling-peach agreement would continue the one now in effect in a modified form. It seeks a simpler method of control, and provides that before harvest a control committee would make a survey of the probable total production and determine the advisable size of the year's pack. Certificates for that quantity would be issued to growers, and canners would buy only from certificate holders. Quick action is sought on this pact, that it may be available for this year's crop.

Sugar Plan Not to Boost Prices; Exempts Floor Stock Taxes

With the administration's sugar program now in effect, consumer industries need fear no immediate or substantial increase in the price of the commodity, according to indications at the A.A.A. President Roosevelt announced a reduction in the sugar tariff from 2 to 1½c. a pound, and the law provides that the processing tax cannot exceed the tariff reduction.

While the purpose of the sugar stabilization law is to increase prices to growers of cane and beets and while the allotment of supply to market demand may ultimately reflect an increase in price to consumers, observers predict that the increase will come very gradually, because of the tremendous stocks now on hand that will have to be held off the market because of the quota limitations.

The A.A.A. estimates that revenue from the sugar-processing tax will amount to $63,000,000 annually. The tax will be ½c. a pound on 96-deg., or raw, sugar, and increase by degrees of polarization. The tax, which will have to be paid on floor stocks and refined granulated sugar, both beet and cane, will amount to 0.0535c. per pound, on that basis. The processing tax on syrups and edible molasses was the subject of considerable controversy at the A.A.A. The Adjustment Administration planned to base it on total sugar content, and heated protests were filed by domestic sugar-cane interests, who contended that it should be based on recoverable sugar content. The processing tax is to be paid on the final production of direct consumption sugar. A compensating tax is collected against imports of direct consumption sugars. The floor stocks tax on beet sugar does not have to be paid until the month in which the stocks are sold or used in manufacture.

There is no floor stocks tax on imported sugar which paid the rate of duty existing Jan. 1, 1934; on sugar stocks of manufacturers or converters for use in the production of any article, except that to be delivered under contract entered into prior to April 25, 1934; nor on articles processed from sugar, such as confectionery.

A Higher Tax on Corn?

With enactment of the processing tax on sugar, corn processors are wondering if they will be faced with an increased tax in the near future. The processing tax originally scheduled for corn was 28c. a bushel. It is now only 5c. and has been held there because corn processors protested they would be placed at a decided disadvantage against such competitive products as imported starches and cane and beet sugar.

Code Authorities Named

Code authorities for peanut butter, Atlantic mackerel fishing and southern New England fish preserving have been approved by N.R.A. That for the peanut butter industry includes the following individuals:

Owen Earhart, J. W. Beardsley's Sons, Newark, N. J., chairman; W. A. Barnes, Wheeler Barnes Co.; Clarence J. Cook, Cream Dove Manufacturing Co.; H. J. King, King-Fuller Co.; W. A. Richards, Tom Huston Peanut Co.; J. L. Rosefield, Rosefield Packing Co.; and A. E. Wehmeyer, Maury-Cole Co.

These men comprise the code authority for the Atlantic mackerel fishing industry:

John A. Dahlmer, Lemuel R. Firth, Reuben Cameron, Benjamin Curcuru, Edward Proctor, Joseph Palazola, John Barrett, Peter Mercurio, David Keating, John Chiancola and Benjamin Pine, all of Gloucester, Mass.; Otis Thompson, Portland, Me.; Courtland Brackett, Monhegan, Me.; James M. Burke, Provincetown, Mass.; and Frank F. Grinnell, Saconnet Pt., R. I.

The authority for the southern New England fishing industry was appointed

to serve only until July 21. The following are the members:

Henry F. Brown, Booth Fisheries Co.; Edward J. Morris, Davis Bros. Fisheries, Inc.; Fred A. Grant, Chas. F. Mattlage & Sons Co.; Frank F. Smith, Frank F. Smith Co.; Frederick McG. Bundy, Gorton-Pew Fisheries Co., Ltd.

Appointment also has been made of an administration member for the peanut-milling code authority, Charles H. Johnson, Jacksonville, Fla., being named.

Dairy Industry and A.A.A. At Odds on New Bill

Having locked horns over the "Fiesinger bill," introduced before the House early last month, the dairy industry and the A.A.A. remain at loggerheads. The new bill proposes to tighten enforcement of marketing agreements, provide local self-government in marketing areas, and allow fixing resale prices.

To the latter provision, A.A.A. took particular exception, having decided after months of experiment that it was not feasible to regulate retail milk prices. And A. H. Lauterbach, head of the dairy division, explained that to pass the administration the bill would have to be amended in several particulars. One change would be to give A.A.A. authority to "regulate capital investment, stock issues, rates of return and quality of service of distributing agencies." Another would give A.A.A. authority to recapture excess profits of distribution.

Milk distributors and cooperatives put up a lively fight for the bill.

Approves Milk Price Probe

Nation-wide investigation of milk prices and distributors' profits appears possible. The Federal Trade Commission is authorized to conduct such an investigation by the Kopplemann resolution which passed the House, May 14. This measure was brought up on the unanimous consent calendar and met with no objection. The reason for this action goes back to an A.A.A. audit which revealed that distributors in Philadelphia, Chicago, Boston and St. Louis made alleged net profits of 30.76, 25.84, 22.45 and 16.64 per cent, respectively, for the five-year period ending Dec. 31, 1933.

Much Milk Under License

A.A.A. continues to extend milk licenses to new areas and to haul up on the carpet companies violating those already in effect. Nineteen of the new licenses were operating at the beginning of May, covering 15 per cent of total urban milk sales. And during the month, licenses went into effect at Lexington, Ky.; Wichita, Leavenworth, and Kansas City, Kan.; Lincoln, Neb., and Sioux City, Iowa.

At Detroit, a milk industry advisory board was established, the first such board to be created. It consists of three representatives of distributors, three of producers and three of consumers. Another dairy development was approval by Secretary Wallace of amendments to the dry-skim-milk marketing agreement, changing the schedule of differentials on dry skim milk for feeding livestock and limiting contracts to 60 days.

In its enforcement activity, the administration called hearings on five cases of alleged violation of licenses in Chicago and ordered a Boston dairy to show cause why its license should not be revoked.

Copeland Bill Up Again But It Gets Nowhere

Senator Copeland revived his food and drug bill on May 16, but was unable to keep it on its feet for more than a one-day stand, which indicates that almost insurmountable opposition stands in the way of its enactment this session. The move to bring up the bill was carried by only four votes, 26 to 22. And several senators referred to the voluminous objections against the bill that had been submitted to them.

Copeland sought to have the measure read for action on the amendments which it carried as reported from the Commerce Committee March 15 and several others prepared by the committee since then. But he succeeded only in obtaining unanimous consent to have it reprinted with all amendments.

The new amendments relate principally to exemption of fresh fruits and vegetables from various provisions of the bill and were accepted by the committee in response to objections from the International Apple Association.

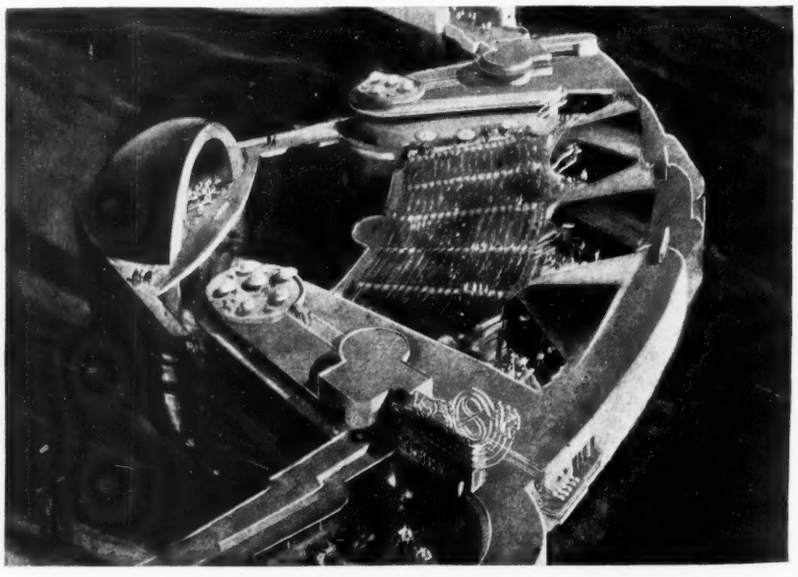
Of broad significance is an amendment providing that restraint by injunction may be had on complaint of any interested party if it is shown that any regulation is unreasonable. Specific provision for assessment of damages against the Food and Drug Administration when judgment is rendered for the claimant in seizure cases is provided in a substitute for Sec. 16 (b).

Individual containers used in the distribution of small fruits are included in the provision authorizing the Secretary of Agriculture to exempt from labeling or packing requirements food which is subsequently repacked. The requirement, Sec. 7 (f), that labels bear name and ingredients is confined to "fabricated foods."

Duties on Clams Changed

Approving a report of the Tariff Commission, President Roosevelt effected a decrease in the rates of duty on canned razor clams from 35 to 23 per cent ad valorem, at the same time increasing the duty on other canned clams by making them dutiable at 35 per cent assessed on American selling price. These changes became effective May 31.

The 35 per cent duty on clams other than razors is equivalent to 113 per cent of the foreign value of such clams in 10-oz. tins and 98 per cent of the foreign value in 15- and 16-oz. tins. These new rates of duty also apply to combinations of clams with other substances, except clam chowder, on which the duty remains 35 per cent of foreign value.



BIG THREE EXHIBIT AT FAIR

At this year's Century of Progress, the meat packing industry plays a big role. The Swift Bridge of Service, built on piles over the lagoon, includes a water theater and floating stage. Armour & Co. and Wilson & Co. also boast individual buildings. The latter feature plant operations in their exhibits, while Swift portrays laboratory control.

Charges Against Packers Upheld at Hearing

Meat packers charged by Secretary Wallace with collusion and price fixing moved to have the charges dismissed at a hearing May 17 under John M. Burns, of the Department of Agriculture. The packers held that the complaint was "general, indefinite and uncertain, naming neither times nor places of the alleged acts and failing to inform respondents of the violation." Burns, however, refused to dismiss the charge, stating that the government proposes to introduce evidence to show that the packers met in Memphis in 1932 for the purpose of fixing prices for the sale of meats and meat-food products and also that such acts were committed as threw certain competitors out of business. He also mentioned that testimony would be introduced showing an agreement to apportion sales and territories.

Twelve meat packers are among the respondents, including: John Morrell Co., Swift & Co., Wilson & Co., George A. Hormel, Armour & Co., Morris Packing Co., North America Provisions, Inc.; Cudahy Packing Co., Abrahams Bros., Memphis Packing Co., Birmingham Packing Co., and Jacob Dold.

Meat Packers Organize

Ten of the larger meat packers have organized an "Association to Maintain Freedom in Live Stock Marketing." This group, of which Oscar G. Mayer is chairman, will familiarize the public with the economics involved in the marketing phase of the livestock industry. "We shall defend direct marketing of livestock from unjust criticism and attack, but it is not the purpose of our organization to promote or favor any type of marketing at the expense of any other type," Mr. Mayer stated.

Members include Rath Packing Co., Armour & Co., John Morrell & Co., Jacob E. Decker & Sons, Wilson & Co., Oscar Mayer & Co., George A. Hormel & Co., Swift & Co., T. M. Sinclair & Co. and Cudahy Packing Co.

Stockyards Handle Supplies

Disastrous though it was, Chicago's stockyards fire on May 19 did no damage to packing houses and did not cripple facilities for handling livestock to the extent reported. Cattle pens took the brunt of the fire, about 75 per cent of them being leveled to the ground. Fortunately, light Saturday holdings minimized the bovine losses and not more than 300 perished. Neither the hog nor sheep pens were touched.

Emergency repairs and switching of facilities in the yards enabled incoming stock to be handled on Monday morning following the fire.

SECRETARY WALLACE

He would have broad powers over food processors under proposed amendments to the Agricultural Adjustment Act.

HORS D'OEUVRES

MILK CANDY has been perfected at Iowa State College, having been discovered by a student while cleaning a gummed-up mess out of a milk drier. He burned his fingers, stuck them in his mouth, and found them good. Something like Lamb's tale about roast pig.

•

MAPLE SAP is being reduced to syrup in a milk condensery at Antigo, Wis., the clarifiers and vacuum pans handling milk by day and sap by night. The syrup is of superior quality and prospects are sweet.

•

A.A.A. HAS THE LAUGH on dairymen in the drought States. Nature's production curtailment would have been paid for under the program which the A.A.A. suggested and which dairymen turned down.

•

ONLY PRETZELS and popcorn can be served free with beer in Wisconsin —the champion cheese State.

•

A SPARTON BUGLE distinguishes house-to-house wagons of Purity Bakery, Providence, R. I., and tells the housewife the cake is coming. Purity finds it pays to toot one's horn.

•

TEA ADVERTISING (White Rose) a year back stressed low cost with the slogan, "Don't Forget Your Change." But now it features quality with "Extra Strength, Extra Flavor." Sherlockian deduction tells us consumers must have more buying power.

•

COD-LIVER OIL has been proved by a German scientist to be effective in healing wounds. Judging from present world relations, there is a future for this product.

•

"FISH TUESDAY" is a recent innovation in New York, the idea being to demonstrate that fish are abundant and cheap and that they're edible on days other than Friday.

Fate of AAA Amendments Regarded Uncertain

After having been thrown for a loss by the food-processing industries, Secretary Wallace's proposed amendments to the Agricultural Adjustment Act got on their feet again in the Senate Agriculture Committee and were reported out after a secret vote of 9 to 3. As approved by the committee, the amendments were altered to provide that a two-thirds majority of producers can block a marketing agreement or license, but there was no change favoring processors in the important licensing sections. Another new provision permits the Secretary of Agriculture to refund or temporarily cancel a processing tax where it would reduce consumption of the commodity.

As to whether this legislation will go through, there is much difference of opinion. A.A.A. officials believe it will. Food processors, however, are of the opinion that it may not, even though President Roosevelt approves it.

Originating as the Smith bill in the Senate, the amendments were designed to prevent possible upset of relief programs by court action after Congress had adjourned. Their purpose was to remove ambiguous language and questionable power of enforcement from the Adjustment Act. Actually, the bill seeks to extend marketing and licensing agreements to other than basic commodities. It clarifies the quota and allotment rights of A.A.A. and provides that quotas may be established only if requested by more than two-thirds of the industry or by producers controlling two-thirds of the acreage. It also includes the much-contested provision that the Secretary may have access to books and reports. Other provisions cover assessments for financing enforcement of marketing agreements and licenses and make more definite those sections of the A.A. Act which seek to give agricultural commodities a purchasing power proportional to the cost of things the farmer buys.

The Smith bill was started through the legislative mill without a hearing, but protests were so many that a halt was called. Millers' National Federation and Institute of American Meat Packers were first to realize the shortcomings of the measure and the dictatorial power which it would give the Secretary.

Two Excise Taxes Repealed

Excise taxes on both candy and soft drinks went out of existence when President Roosevelt signed the Revenue Act of 1934 on May 10. At the same time, however, a 5c. tariff on coconut oil, with 2c. preferential for the Philippines, was established.

Repeal of the two excises will save

confectioners more than $3,500,000 annually and bottlers about an equal amount. The coconut oil tariff will burden some food industries and aid others, but there is yet a chance of its being modified. The President disapproves and will message Congress to that effect.

Flavoring Extract Trade Meets in New York

Celebrating the silver anniversary of Flavoring Extract Manufacturers' Association, flavor producers from several sections of the country convened in New York May 21-23. Codes, food and drug legislation, standards, and protection of extracts against chemical changes were subjects of papers and discussions. Of wide interest were talks by George M. Armor, N.R.A. industrial adviser, on "Our Code and Code Administration in Washington," and by E. L. Brendlinger, on "Pure Food and Drug Legislation." None the more interesting but more practical was a paper on the cost of manufacturing flavoring extracts, by Frank L. Beggs and E. L. Brendlinger, and another entitled "Oxygen—the Enemy of Flavor," by Dr. J. H. Toulouse, research director of American Bottlers of Carbonated Beverages. The reports of the research committee likewise occasioned much interest, especially the one covering action of light rays on flavoring extracts.

Officers elected by the association include W. F. Meyer, Warner-Jenkinson Co., St. Louis, president; George M. Armor, McCormick & Co., Baltimore; Clark C. Nowland, Geo. H. Nowland Co., Cincinnati; and W. J. Sunn, Baker Extract Co., Springfield, Mass., vice-presidents; Frank L. Beggs, Styron-Beggs, Newark, Ohio, treasurer; and John S. Hall, executive secretary. The retiring president, B. H. Smith, Virginia Dare Extract Co., Inc., Brooklyn, became a member of the executive committee.

Spice Grinders Meet

To increase the consumption of spices, $1,000 has been authorized to investigate the possibilities and propose a plan of publicity to make the country more "spice-conscious." The spice grinders made this move at the annual convention of American Spice Trade Association, held in New York, May 8-9, appointing a publicity committee headed by M. L. Van Norden. At this meeting members discussed the code, which became effective May 21, and other problems, laying aside restraint and speaking frankly.

At the close of the meeting, the spice grinders reelected Lloyd M. Trafford to his third term as president. George M. Armor is again vice-president, and Paul D. Hursh is treasurer.

Quality of Imported Figs Greatly Improved

Adoption of American processing methods by foreign producers and strict inspection at United States ports of entry have effected great improvement in the quality of dried figs coming from Turkey, Greece, Italy and Portugal. Lots aggregating nearly 5,000,000 lb. were examined by the Food and Drug Administration during the year ending Dec. 31, 1933, and it was necessary to reject only 16,558 lb., or one-third of one per cent. This is in marked contrast with conditions in 1931, when 20 per cent was found unfit for food.

Voluntary Inspection Again

Inspection of food plants under a set-up somewhat similar to the voluntary inspection section of the original Tugwell bill, S. 1944, is provided in a new bill, S. 3655, introduced by Senator Stephens May 21. His bill amends the Food and Drugs Act of 1906 to provide for voluntary inspection on application of 60 per cent of the packers of any sea food and a government mark to indicate the conformity of the food to inspection requirements, the cost to be paid by the industry.

CONVENTIONS

JUNE

4-5—National Cottonseed Products Association, New Orleans, La.

4-8—American Association of Cereal Chemists, Royal York Hotel, Toronto, Ont.

4-8—Association of Operative Millers, Royal York Hotel, Toronto, Ont. C. W. Partridge, 516 Board of Trade Bldg., Kansas City, secretary.

8-11—Society of Grain Elevator Superintendents, annual, Chicago, Ill. Dean M. Clark, 332 South La Salle St., Chicago, secretary.

10-12—New England Bakers' Association, New Ocean House, Swampscott, Mass.

11-12—Certified Milk Producers' Association of America, Statler Hotel, Cleveland. Dr. Harris Moak, 360 Park Place, Brooklyn, N. Y., secretary.

11-12—American Association of Medical Milk Commissions, Statler Hotel, Cleveland.

11-13—National Macaroni Manufacturers' Association, annual, Edgewater Beach Hotel, Chicago, Ill.

11-15—National Confectioners' Association, convention and exposition, Waldorf-Astoria Hotel, New York, N. Y.

26-28—American Dairy Science Association, Ithaca and Geneva, N. Y.

JULY

10-12—National Confectionery Salesmen's Association of America, annual, New York, N. Y. Henry H. Michaels, 282 Northern Ave., New York, secretary.

11—Mid-West Shippers' Advisory Board, quarterly, Milwaukee, Wis. A. W. Wilkins, 59 East Van Buren St., Chicago, secretary.

KUNO PLEHN
Elected President of Associated Bakers

Baking Group Demonstrates Refrigerated Dough

Through demonstrations and papers, the advantages of refrigerated dough were effectively illustrated at the annual convention of Associated Bakers of America, held early last month at Louisville, Ky. It was in the "Bakery of Tomorrow," a real production unit, that the demonstrating bakers did their work.

Speaking on "Building Trade With Refrigerated Doughs," William F. Thie, Cincinnati, stated that refrigeration improves the quality of sweet, yeast-raised goods. He told the bakers that when prepared ahead of time and kept at a low temperature, sweet doughs take on an improved quality. Other attributes of the refrigerated dough, according to Mr. Thie, are that it enables the baker to produce a wide variety of sweet goods and to bake them at intervals during the day so as to keep warm products on the shelf. Furthermore, the use of refrigeration cuts overhead expense, because the baker turns out products two or three times daily instead of having one large baking which must last the entire day.

The bakers elected to serve as officers: President, Kuno Plehn, Louisville; vice-presidents, F. G. Jungewaelter, St. Louis; E. H. Braunig, Jr., St. Paul; and Jack Koenig, Jr., Chicago; treasurer, George Geissler, Joliet.

Canners' Exchange Opens In Philadelphia

Philadelphia's Canned Foods Exchange began operation May 7 as the country's only public center for trading in futures on canned foods. Although the volume of the first day's trading was small, amounting to only some 7,000 cases, there was reputed to be a favorable trade reaction to the venture. Initially, the exchange is trading only in contracts for tomatoes, peas, corn and green beans, with U. S. Grade C as the basic grade.

Proponents of the exchange declare that it will invest the products dealt in with a degree of liquidity not otherwise

HOWARD J. MOUNTREY

Appointed a member of the Industrial Advisory Board of N.R.A., Mr. Mountrey is taking a three-month leave of his duties as a vice-president of Borden Sales Co., Inc. He reported at Washington May to represent the industry in discussions on codes.

enjoyed; facilitate financing for producers and distributors; provide an authoritative yardstick of price levels; and make the law of supply and demand the basis of prices. And since the exchange has adopted government grades, its influence is expected to stimulate government inspection and certification.

However, the opposition to this method of trading argues that the influence of grade, appearance, taste and other qualities is too important to the canned foods buyer to permit prices quoted on the exchange to take any form of finality. And in this connection it is pointed out that the exchange is dealing in a product after conversion into the form in which it is consumed, making price fluctuations much more upsetting than in such commodities as wheat.

Recovery Act Pays Way

Total revenues from processing taxes and funds appropriated under the recovery act will exceed the cost of production adjustment and surplus removal programs for basic commodities by $4,120,136 when they are completed in 1936, the A.A.A. estimates. Revenues are expected to total $1,007,722,850, with $970,722,850 anticipated from processing taxes and related sources and $37,000,000 from N.I.R.A. funds allocated by the President for the corn-hog program. Estimated expenditures are placed at $1,003,602,714.

To Change Pea Standards

Early this month some action is expected toward modification of standards for canned peas, tomatoes and cherries under the McNary-Mapes amendment. Comments on proposed changes were sent in by the canning industry under the deadline of May 15.

The pending revisions for peas were drafted following the discovery that the percentage of water-insoluble solids in drained peas is an index to maturity. And the plan is to modify the regulations so that peas shall not be considered immature if the water and soluble solids in the drained peas exceed 22 per cent or when 25 per cent or more of the peas are swollen sufficiently to rupture the skin to the extent of $\frac{1}{16}$ in. or more.

The present tomato standard permits mixtures of green tomatoes with fully ripened ones, and these regulations will be made more explicit. The standard for canned cherries will be reworded because of confusion in interpreting the statement on pitted whole cherries.

CONCENTRATES

Unless conditions change considerably, the processing tax on wheat will be increased from 30 to 40c. a bushel by July 1 . . . A.A.A. is investigating possibilities of using licenses to enforce the evaporated-milk marketing agreement, this being suggested by the industry . . . Canners processing fruits and vegetables in the State where grown no longer will be required to take out an annual license, the Perishable Agricultural Commodities Act having been amended recently to do away with that.

●

A 30-day continuation of its stay from the maximum hours limitation of the beet-sugar industry labor code was granted Great Western Sugar Co. May 3 . . . The proposal of the code authority for the trucking industry requiring "not for hire" vehicles to be registered was disapproved by N.R.A. . . . The administration has approved a grant of $150,000 to develop the sweet-potato starch industry in the South.

●

Cuban producers are attempting to develop a market for canned lobster in the United States, a trial shipment having been made . . . The addition of 10 per cent carbon dioxide to the air of a ship's hold in which chilled beef was transported from Australasia to Great Britain was effective in preserving the meat.

●

American Bottlers of Carbonated Beverages has issued a booklet entitled "Suggestions on Elimination of Spoilage in Carbonated Beverages" . . . Within a period of three weeks, 22 applicants have been voted membership in National Confectioners' Association . . . To promote sales of coffee, Arbuckle Bros. attach a small picture machine to the top of a can; when the shopper picks up the can to look at it, pictures illustrating the production of the coffee and emphasizing quality flash before his eyes.

Packers Should Use Metal To Cut Shrimp Spoilage

To prevent heavy spoilage, such as resulted in a large number of seizures last season, shrimp packers have been advised to substitute metal for wood where the product comes in contact with equipment. This is the recommendation made by Norman Hendrickson, director of the shrimp section of National Canners' Association, as a result of a survey of bacterial infection.

Wooden blanch and brine tanks should be replaced with metal or metal-lined ones, and picking tables should be covered with metal. Moreover, old-time wash tanks ought to be replaced by continuous washers using fresh water, and either of metal or metal-lined; the flume type of tank is economical. Metal containers ought to be used also in transferring the shrimp to blanch tanks.

Mr. Hendickson further recommended better and more prompt handling of shrimp from the fishing grounds to the factory, with thorough cleansing and sterilizing of boats after unloading and the elimination of "stales" by passing the shrimp over an inspection belt prior to processing.

Labor Demands, and Gets, Wage Concessions

Labor problems would seem to be transcending in the food industries, judging from activities on many fronts during the past month. Meat packers, who refused to let N.R.A. set up an industrial relations council for labor disputes, suffered strikes in three cities. Union butchers and meat cutters, meeting May 13 in St. Louis, called a strike involving about 2,500 in 25 plants, including those of Swift and Armour. These workers ask a minimum of 75c. an hour for butchers and 60c. for laborers, with a guaranty of a 32-hour week. At Cedar Rapids, 1,200 employees of Wilson & Co. struck because of company-union troubles, while in Des Moines, workers in three packing houses demanded a 10 per cent wage increase and a cut in hours from 40 to 32.

Campbell Soup Co. has pacified workers at its Camden (N. J.) plant, but to do this required a wage increase of 7 per cent, which put the rates at 50, 40, and 36c. an hour, respectively, for men, boys and women.

Out in the sugar-beet sections of Colorado, Wyoming, Montana and Nebraska, where planting had been delayed by uncertainty over sugar legislation, there now arises a labor shortage which threatens to curtail production. It seems that the Mexican labor element prefers to live on charity rather than work in beet fields.

(Turn to page 290)

MEN . . . JOBS . . . AND COMPANIES

Industry

AMERICAN RESEARCH PRODUCTS, INC., formerly Sun-A-Sured, Inc., Chicago, a wholly owned associate company of General Mills, Inc., will act as marketing agent for various products, including food derivatives and dietary adjuncts, developed in General Mills research laboratory work.

F. E. BOOTH Co. plant, Centreville, Calif., will spend $15,000 on new machinery and additions in planning for the biggest fruit and tomato pack in its history. All fruit-packing operations formerly done at the Pittsburg plant, which will now be used for sardine canning only, will be done at the Centreville factory.

BREWING CORP. OF AMERICA, Cleveland, Ohio, will begin national distribution of Carling's Red Cap Canadian ale July 1.

CAMPBELL PACKING CORP. has purchased the George A. Hyde canning plant, Campbell, Calif., which it operated under lease last year. New equipment will bring the capacity to 350,000 cases a year.

CARONUT Co. plant, Florence, S. C., was damaged by fire last month at a loss of $25,000.

COLONIAL BAKING Co., Little Rock, Ark., recently spent $20,000 in remodeling its plant.

COX BAKING Co., INC., Jamaica, N. Y., filed a petition in bankruptcy last month in federal court. Production and distribution continue under receivership.

DAIRYMEN'S COOPERATIVE ASSOCIATION, INC., Providence, R. I., plans to build a milk-processing plant at a cost of about $45,000.

DIXIE - PORTLAND FLOUR Co., Memphis, Tenn., has acquired Majestic Milling Co., Aurora, Mo., and will operate the plant beginning July 1.

GENERAL BAKING Co., New York, will add additional space to its Hartford (Conn.) plant at a cost of $100,000.

HANSEN PACKING Co., Butte, Mont., has filed suit against Swift & Co., Chicago, for $6,000,000, triple damages, under the Sherman and Clayton anti-trust laws.

HOLSUM PRODUCTS, INC., Milwaukee, will operate recently acquired Madison Food Products Co. as a subsidiary, but will retain its name unchanged.

LA CHOY FOOD PRODUCTS Co., Detroit, recently opened a Chicago factory, with French Jenkins as manager. Plants at New York, Boston, Philadelphia, Cleveland and St. Louis are planned during the year.

REED BAKING Co. plant, Philadelphia, was damaged by fire recently at a loss of nearly $15,000.

SHARPLESS-HENDLER ICE CREAM Co., Wilmington, Del., will remodel its Trenton (N. J.) distributing station at a cost of about $14,000.

SOUTHLAND DAIRIES, INC., plans to enlarge and improve its Jacksonville (Fla.) plant at a cost of $30,000.

SOUTHERN SYRUP Co., INC., recently organized Anheuser-Busch affiliate, has leased a 3-story building in New Orleans where corn, cane syrup and molasses will be packed.

STERLING BREWERS, INC., Evansville, Ind., is expanding and improving its plant at a cost of about $125,000, to bring production up to 1,000 bbl. a day.

TOBIN PACKING Co., Rochester, N. Y., will build a meat packing plant at Fort Dodge, Iowa, to cost about $300,000.

WASHINGTON WINERIES, INC., Tacoma, Wash., is building a winery on the property of Fleischmann Yeast Co., Sumner, to cost $100,000.

WESTON BISCUIT Co., Passaic, N. J., has added a 4-story brick building to its plant.

PERSONNEL

CLAUDE S. ALLEN, C. S. Allen Corp., Brooklyn, has succeeded Wm. F. Heide, Henry Heide, Inc., New York, as chairman of the second zone, Industrial Recovery Division, National Confectioners Association.

GEORGE ARMSTRONG, Cudahy Packing Co., Chicago, is chairman of the committee on purchasing practice, Institute of American Meat Packers, succeeding J. B. Rohers.

FRANKLIN BAKER, JR., former president, Franklin Baker Co., and director, General Foods Corp., has been elected president, Baker Products Co., Orlando, Fla., now marketing "orange sauterne" nationally. Baker Wines & Spirits Corp., the distributing unit, is headed by Elbridge Adams, formerly vice-president in charge of wine and spirits sales for Canada Dry Ginger Ale, Inc.; its directors are Mr. Baker, Mr. Adams, Ralph C. Coburn, vice-president, General Foods Corp., and Charles A. Blackwell.

F. M. BAUER, former assistant superintendent, Gay Package Co., East St. Louis, Ill., is now superintendent, Perry (Iowa) Packing & Provision Co. of Iowa.

RALPH S. BROWN, formerly with Auley-Brown Canning Co., Girdletree, Md., and Z. H. CHERRIX have purchased Farmers' Canning Co., Snow Hill, and will pack peas, tomatoes and lima beans under the name of C. & B. Canning Co.

F. B. CHILDS, Libby, McNeill & Libby executive at Chicago, has been appointed resident adviser to N.R.A. at Washington. His duties are expected to require a 60- to 90-day stay.

LEROY PETERSON

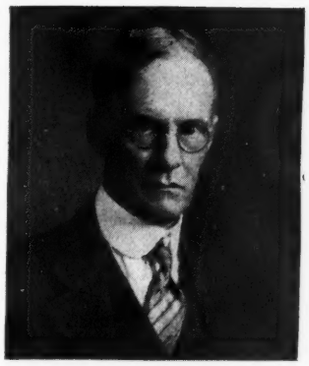
Formerly on the staff of the Consumers' Counsel of A.A.A., he has been ratified as supervisor of the code of the live poultry industry in metropolitan New York.

M. L. CROUTHAMEL, former head of the quality control department, H. J. Heinz Co., Berkeley, Calif., is now in the quality control department at the Pittsburgh factory.

ALLEN W. CRUIKSHANK, former secretary and treasurer, Cruikshank Bros. Co., Pittsburgh, has been elected president of the company, succeeding the late Frank Cruikshank.

CLIVE C. DAY, vice-president, Peter Cailler Kohler Swiss Chocolate Co., has resigned as secretary, Association of Cocoa and Chocolate Manufacturers of the U. S. He has been succeeded by Chalmers M. Hamill, formerly attorney with the receivership department, Irving Trust Co., New York.

A. E. DIXON, secretary, North Carolina Ice Cream Manufacturers' Association since 1918, has resigned. He has been succeeded by G. L. H. WHITE, White Dairy Products Co., Raleigh.



CHESTER YOUNG
Dairylea executive dies

R. R. GOCKLEY, Dairymen's League Cooperative Association, and F. A. WILLS, Supplee-Wells-Jones Co., Philadelphia, are directors of the American Dry Milk Institute.

GEORGE R. HARRISON has succeeded A. R. Wesson as manager, Fall River (Mass.) branch, Cudahy Packing Co., the latter having been transferred to Chicago.

JAMES L. HARVIN, former manager, Freeman Dairy Co., Lansing, Mich., and J. J. MCDONALD, president, McDonald Dairy Co., Flint, have purchased and will operate the former plant under the name Harvin Ice Cream Co.

HUGH F. HUTCHINSON, former manager, Logan (W. Va.) plant, Imperial Ice Cream Co., has become manager of the firm's Huntington plant, succeeding C. H. GRIFFIN, transferred to the Clarksburg plant. D. L. SHANNON is now manager at Logan.

HERBERT B. LARNER, formerly special representative of National Oil Products Refining Co. to the dairy industry, is now with American Research Products, Inc., Chicago, in connection with the organization of a sales program to market Sun-A-Sured vitamin D concentrate on a national scale.

T. A. MCGOUGH, McGough Bakeries, Birmingham, was elected president, Southern Bakeries Association, at the Atlanta convention last month.

C. H. MURDOCH, formerly with Meinrath-Corbaley Co., Seattle, is now at the Portland branch, Northern Pacific Canners and Packers, Seattle.

E. T. OAKES, former chief chemist, National Biscuit Co., New York, is now assistant to J. R. Henry, chief production manager; he has been succeeded by D. J. MAVEETY. P. J. SUNDHEIM, former assistant production manager, National Biscuit Co., Chicago, is now manager at the Wheatsworth plant, New York. RALPH L. SMITH, formerly with the production department in New York, is now manager at the Cambridge (Mass.) bakery.

BERNARD L. OSER, associated with Dr. Philip E. Hawk, president, Food Research Laboratories, Inc., New York, has become director of that organization.

HARRY G. RANDALL, former president, Washburn Crosby Co., Kansas City, Mo., is now president of Prose-Maco Schoolcraft Co., school supply firm, Kansas City, Kan.

MAX H. SOBEL, vice-president and treasurer, Schutter-Johnson Candy Corp., Chicago, resigned from that company May 31.

J. H. WETENHALL, formerly with Breyer Ice Cream Co., Philadelphia, has succeeded Karl Mory as assistant to E. J. Finneran, director of sales and advertising, National Dairy Products Corp.

MARK H. WODLINGER, author of "Bibliographical Survey of Vitamins—1650 to 1930," is president, American Research Products, Inc., formerly named Sun-A-Sured, Inc., Chicago.

DEATHS

WALTER L. BOYDEN, 69, formerly with F. E. Young Co., Worcester (Mass.) confectionery firm, at Beverly, May 19.

S. E. HUIBREGTSE, 54, president, Ripon (Wis.) Packing Co., near Ripon, May 10. Prior to joining the packing firm, he was associated with Ripon Canning Co.

WAYNE S. KELL, 49, production manager, Coca-Cola Co., Atlanta, at Rochester, Minn., May 2.

LEROY LANG, 48, dairy authority and member of the executive board, H. P. Hood & Sons, Inc., Charlestown, Mass., at Melrose, May 3. While at the University of Illinois, he discovered the commercial application and value of the *bacillus bulgaricus* in the production of buttermilk.

WILLIAM J. MORRIS, JR., 54, regional vice-president, Washburn Crosby Co., at New York, April 29. Starting with the company as salesman in 1909, he became vice-president in 1928.

JOY MORTON, 78, chairman, Morton Salt Co., near Chicago, May 9. In 1885 he gained the control of the company which became the Morton Salt Co. He was the son of J. Sterling Morton, who founded Arbor Day in 1872.

WILLIAM C. PROCTER, 72, chairman of the board, Procter & Gamble Co., Cincinnati, at Glendale, Ohio, May 2. He served as president of his firm from 1907 to 1930, when he was elected chairman. During his long term as chief executive, he gained considerable prominence through experiments and innovations in the interest of labor.

WILLIAM H. REYNOLDS, 75, superintendent, manufacturing department, F. G. Shattuck Co., New York, at New Rochelle, May 18.

WILLIAM C. PROCTER
P. & G. board chairman passes

CARL W. SIMS, president, Sims Milling Co., Frankfort, Ind., May 6. He had been a director, Millers' National Federation, and president, Indiana Millers' Association.

DAVID WESSON, 73, pioneer in developing cottonseed oil products, and technical director, Southern Cotton Oil Co. since 1918, at Montclair, N. J., May 22. He was past president, American Institute of Chemical Engineers and, from its inception, a member, editorial advisory board, FOOD INDUSTRIES.

JAMES A. WINKELMAN, 64, former vice-president and treasurer, Winkelman Baking Co., Memphis, Tenn., at Clearwater, Fla., April 26.

CHESTER YOUNG, 57, treasurer, Dairymen's League Cooperative Association, since 1923, at Napanoch, N. Y., April 27. He had been a director of the league since 1920.

Associated Industries

GAIR CO. OF CANADA, LTD., newly organized subsidiary of Robert Gair Co., Inc., is now operating Canadian Paperboard, Ltd., paper mills at Toronto, Montreal, Frankford and Cammerford.

PFAUDLER CO., Rochester, N. Y., has opened a British factory at Leven, Fifeshire, Scotland, the new company to be known as Enamelled Metal Products Corp., Ltd. Its registered office is at Artillery House, Artillery Row, London, S.W. 1.

SAFETY REFRIGERATION, INC., formerly at 75 West St., has moved its offices to 230 Park Ave., New York.

S. K. F. INDUSTRIES, INC., executive offices in New York have been transferred to the plant at Front St. and Erie Ave., Philadelphia.

EMERY THOMPSON, 60, president, Emery Thompson Machine & Supply Co., New York, died April 30. He invented the brine ice cream freezer in 1900, and pioneered in the general development of the ice cream freezer.

BUSINESS TRENDS

Canners' Holdings Decrease, Distributors' Stocks Up

Canned fruit and vegetable stocks held by 804 canners on April 1, with the exception of peaches, were from 21 to 62 per cent less, for all items covered, than the holdings on April 1 of the previous year. Distributors' stocks were 13 per cent larger than on the same date in 1933 and 7.0 per cent larger than at the end of the first quarter of 1932. However, distributors' holdings since Jan. 1 were reduced 20 per cent, while during the first quarter of 1933, when stocks were 23 per cent less, they were reduced 15 per cent.

Canners' stocks of peas, corn, tomatoes, green and wax beans, peaches, pears and pineapple totalled 11,078,274 cases, compared with 17,052,884 last year. Only peach stocks were larger, amounting to 2,851,017, compared with 2,402,042 cases last year. Stocks of peas and corn were 62 and 45 per cent, tomatoes and pineapple 44 and 42 per cent smaller, respectively, than last year. Figures are those of the Foodstuffs Division, Bureau of Foreign and Domestic Commerce.

BASIS FOR THE CURVES

Retail food prices, factory employment, factory payrolls and wholesale prices are based on indexes of the Department of Labor. Cost-of-living index is that of the National Industrial Conference Board. Electrical-power-consumption figures are furnished by *Electrical World*.

Prices at New High

Commodity prices during the last two weeks of April and the first two weeks of May showed gains which carried the price index to its highest point since May, 1930. Continued drought sent grain and food prices sharly upward, although hogs and pork were decidedly weak and lard hit its bottom for the year.

Business activity receded somewhat in early May, as production was curtailed in the automotive, textile, electric-power and lumber industries. However, around the middle of the month it appeared to be stabilizing, with steel and electric-power operations comparable to their April levels.

The Business Week Index of business activity stood at 67.1 per cent normal for the week ending May 12 —1.4 per cent above April 14.

Wholesale prices reported by U. S. Department of Labor for the month ending May 12 were up 0.5 per cent to 73.8 from the figure of April 14, reaching the level of March 10, the highest since April, 1931. Farm products were unchanged, manufactured foods up 0.7 per cent.

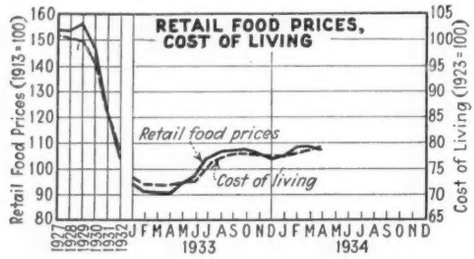
All commodities during the month ending May 19 rose 0.3 per cent to 75.4 in the New York *Journal of Commerce* weighted price index, topping the year's high on Feb. 17 and April 21. Grain rose 8.0, but food fell 0.7 per cent.

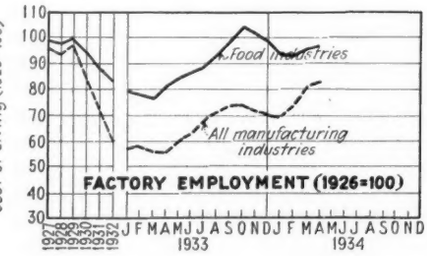
Winter Wheat Forecast Drops As Drought Continues

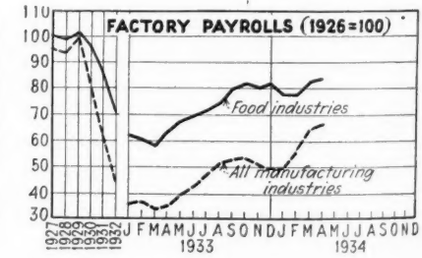
Based on its condition as of May 1, the prospective winter wheat crop has been forecast by the Department of Agriculture at 461,471,000 bu., about 30,000,000 bu. less than forecast on April 1 and 170,000,000 bu. under the average crop for the past ten years. The May 1 condition, 70.9 per cent of normal, is the lowest reported for the same date since 1885.

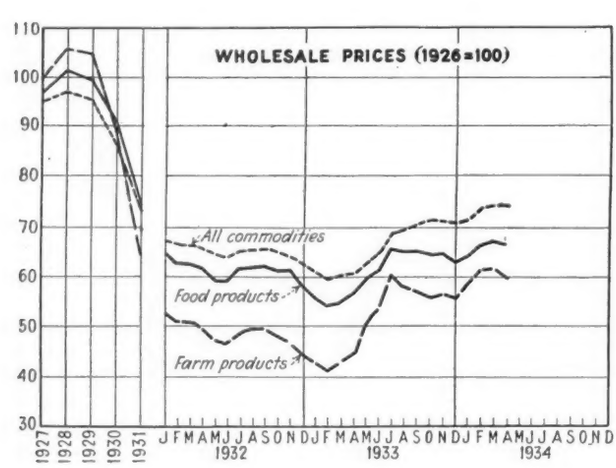
The drop in the forecast reflects the severe drought conditions in the wheat-producing areas, and a precipitation from Jan. 1 to May 1 approximately 40 per cent of normal. However, it does not reflect the even more serious drought condition existing from May 1 to May 10, when the forecast was issued. In the ten-day period, rainfall in the principal wheat-growing areas was less than one-fourth of normal.

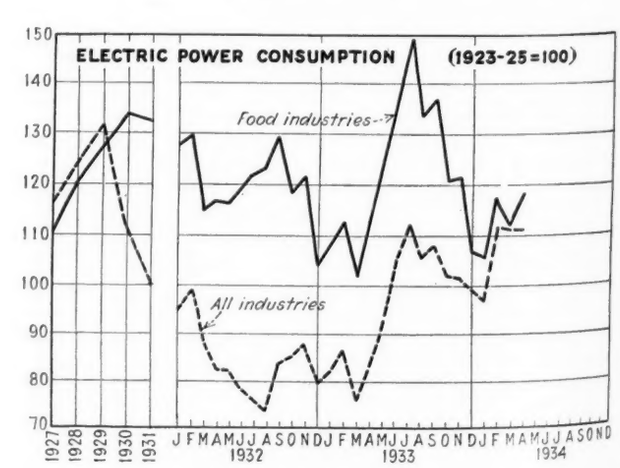
Putting the winter wheat crop at 461,000,000 bu. and the spring wheat crop at 175,000,000 bu., there would still be a total crop of about 635,000,000 bu., about 15,000,000 bu. below domestic requirements. The normal harvest is about 800,000,000 bu. Offsetting the loss from drought, however, is 260,000,000 bu. of wheat in elevators and farm bins from previous crops. On this basis, the possible carry-over into next year may be well over 200,000,000 bu.











According to the report in which the forecast was made, the drought condition was severest in the area extending on the north from the Dakotas and the eastern quarter of Montana south to New Mexico and the upper western counties of the Texas Panhandle. Conditions were serious also in the corn belt, where the light, dry soil prevented not only germination of the seed planted but further seeding as well.

Acreage Intentions Point To Canners' Surplus

Further indications of probable surpluses in canned foods during the 1934-1935 marketing season appear in the acreage intentions reported to the U. S. Crop Reporting Board. As is pointed out by the Bureau of Agricultural Economics, average yields on the prospective acreages would result in the largest canned food packs since 1930, which, although consumer purchasing power is expected to make some gain, probably will result in low prices to canners, because normal demand likely will not be reached during the market year.

Taking intended tomato acreage as an example, an increase of 16 per cent in planting would normally produce a 14,000,000-case pack, which would leave an average carry-over after domestic demand was satisfied. But tomato canners and growers are planning an increase of 38.5 per cent, which should produce about 17,000,000 cases and, therefore, an excess of 3,000,000 cases.

Reports from 49 beet canners growing 60 per cent of the total acreage indicate an increase of 30 per cent this year over last, the principal increases occurring in New York and Wisconsin. Acreage intentions of 61 kraut packers who utilize 60 per cent of the total cabbage for kraut indicate an increase of 50 per cent over 1933, chief increases to be made in Ohio, New York, Illinois and Indiana.

Face Semolina Shortage

Macaroni manufacturers using semolina face a situation unknown at least for a number of years past; namely, no sizable carryover from 1933 of durum wheat, the exhaustion of semolina stocks, and the prospect of a short crop this year. Most of the durum carryover available is of such poor quality that premiums for No. 1 amber durum have run as high as 34c. above the market. Regarding this year's crop, it is estimated that about one-third has been destroyed by drought, so that, even if the rest were in first-rate condition, there would be a maximum of about 33,000,000 bu., two-thirds of an average crop.

Fishery Packs Announced

Fishery products canned in 377 plants in the United States and Alaska during 1933 amounted to 13,087,000 standard cases, weighing 532,146,000 lb. and valued at $59,631,000—36 per cent more than in 1932. Byproducts were worth $17,248,000. The Pacific Coast and Alaska canned products and byproducts were worth 72 per cent of the total value of the entire fishery output.

Canned salmon packs in Alaska and the Pacific Coast States in 1933 were 5,226,000 and 1,137,000 cases, respectively, of 48 1-lb. cans, according to the Bureau of Fisheries. The Pacific Coast pack was 74 per cent greater than in 1932, while the Alaska pack was very slightly less. The pack in Japan, 773,000 cases, was 213 per cent greater than the previous year; that in British Columbia, 1,265,000 cases, 17 per cent greater.

Canned Food Exports Up

United States exports of canned foods processed in the West during the last six months of 1933 totalled 194,871,985 lb., more than 16,000,000 lb. in excess of exports during the same period of 1932. Shipments of canned asparagus, apricots, pears, peaches and pineapple during January and February of this year were about 100 per cent greater than during the same two months of 1932.

INDICATORS

CANADIAN CANNED FRUIT production declined from 1,336,153 cases in 1932 to 1,044,119 in 1933, while the canned vegetable output, exclusive of soups, baked beans, catsup and tomato pulp, increased from 3,747,195 cases to 4,118,420. Imports and exports of canned vegetables declined, but both imports and exports of canned fruits increased.

FLOUR PRODUCTION in April amounted to 4,959,082 bbl. in approximately 90 per cent of all flour mills in the principal milling centers of the United States. This figure is 1,212,324 bbl., or 20 per cent, less than for April, 1933.

BUTTER CONSUMPTION, while remaining practically static in the United States at 18 lb. per capita, has increased in Great Britain from 15 to 23 lb. per capita, or nearly 50 per cent, in the past ten years.

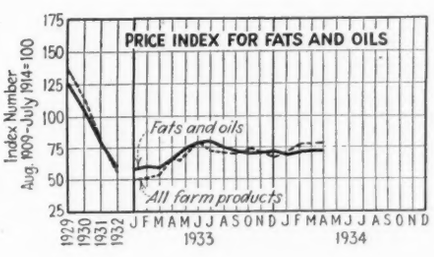
SALES OF PROCESSED CHEESE have increased about 100 per cent in the past five years, it was reported at the Milwaukee meeting of the National Cheese Institute last month.

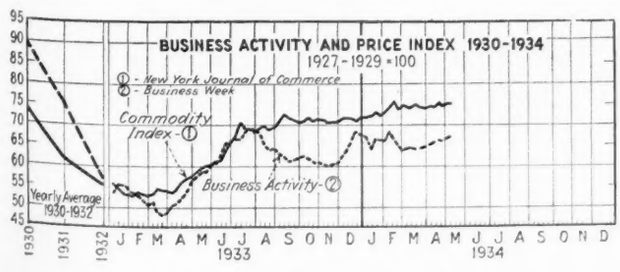
EXPORTS OF PORK from the United States during the first six months of the marketing year have been nearly 35 per cent larger than last year, most of the increase occurring in exports of frozen pork. During the same period lard exports have decreased about 14 per cent, resulting chiefly from reduced exports to Germany.

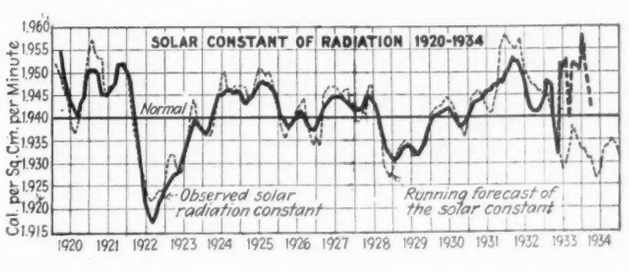
ESTIMATED INCOME from dairy farming during the ten years 1924-1933 averaged $1,762,000,000, or 18.7 per cent of the estimated total farm income during the period. In the ten years, total farm income declined about 43 per cent, while income from dairy farming dropped only 25 per cent.

CONSTRUCTION NEWS

	Pending (thousands)	Awarded May (thousands)	Total Awarded 1934 (thousands)
Bakery Products	.....	$36	$258
Beverages	$2,198	983	5,121
Canning and Preserving	393	261	943
Confectionery	.....	.....	133
Grain Mill Products	380	88	2,967
Ice, Manufactured	58	.....	58
Meats and Meat Products	.....	.....	256
Milk Products	88	140	1,035
Sugar	.....	.....	.....
Miscellaneous	246	341	406
Total	$3,363	$1,849	$11,177







NEW METHODS ...PACKAGES ...PRODUCTS

A three-piece pie package is used by New York Pie Baking Co. A ring stapled to the paper plate holds the transparent cellulose covering in place; the ring may be colored for added decoration. The bakers package 35,000 pies in an 8-hour day with three stapling machines.

Attractive glass containers are fast replacing the ordinary bottle. Labels and closure likewise have gone modern. These trends may be seen in the salad- and olive-oil containers adopted by Del Ray Corp., San Francisco, both of which effectively display their contents.

One of the "window-top" cans used by B. A. Railton, Chicago and Milwaukee, is packed in each four- or five-case shipment to aid retailers in boosting sales. In tests, this type of display increased sales more than 300 per cent, it is reported. Continental Can Co. and Corning Glass Works developed the cans.

Produces Milk Albumin Suitable for Food

Milk albumin of reduced ash content and suitable for modifying milk to correct its deficiency in lactalbumin has successfully been produced at the Bureau of Dairy Industry. Using an electrodialysis unit, the mineral content of the product was reduced to about one-third of its original amount in about eight hours.

Swiss-cheese whey or rennet-casein whey, because of their comparatively low salt content, are well suited for this process of electrodialysis, the Bureau reports. The powder from Swiss-cheese whey usually contains about 50 per cent lactose and, consequently, 30 or more per cent of protein, two-thirds of which is lactalbumin or albumoses.

Tests have shown that cow's milk containing about 5 per cent of the electro-dialyzed whey protein powder yields a finely divided curd upon acidification with dilute hydrochloric acid to the pH range of infant digestion. This indicates that the milk modified with the powder would be of value in infant feeding. Then, too, lactalbumin is held to be an essential protein for the support of growth. Cow's milk contains less than one-half the lactalbumin found in breast milk.

The mother liquor resulting from the crystallization and partial removal of lactose from neutralized and condensed whey contains about 42 per cent of total solids. In the past, some of this liquor has been spray- or drum-dried and a powder obtained which has some possible uses in the food industries. However, a typical powder made from Swiss-cheese whey contains about 17 per cent ash, which restricts its possible uses as a food ingredient.

Rids Flour Mill of Insects Without Closing It

Contending that it was a waste of time and effort to close a mill tight for fumigation, George P. Urban, president of George Urban Milling Co., Buffalo, N. Y., decided to design a fumigating system that would go straight to the source. This he did, using ducts to carry heated air (inert gas may be used) to the machines where the insects breed. A steam radiator heats the air to 130 to 200 deg. F. and a blower delivers it to the equipment. A main duct serves a battery or group of machines, and smaller ducts lead to the individual units. One heating unit can be used to serve the entire mill, or separate heaters may be employed for different sections. In the Urban mill there are four—one for the purifiers, two for the elevators and one for the rolls.

This method of fumigation destroys all stages of insect life, and a two-hour treatment usually is sufficient with a temperature of 175 to 200 deg. F. But where the machines have many cracks and recesses, as much as four hours is sometimes needed.

It does not cost much to install and operate this system, since the air is free, the fans require but little power, and a heating system already is available in the plant.

Following the trend to glass for vacuum-packed coffee, Reid Murdoch & Co., Chicago, has bejeweled its "Monarch" brand with a jar of impressive design. The Knife-O cap makes it easily opened. Yes, Owens-Illinois makes the container.

Tender Leaf Tea in an effective aluminum-foil package has been placed on the national market by Chase & Sanborn. Parchment-lined and sealed, the container is airtight and moisture-proof. Tender Leaf, a blend of orange pekoe and pekoe, is packed in 3½- and 7-oz. sizes.

Powdered Corn Syrup

"Karo, Powdered," prepared from the same base as the nationally famous Karo Syrup, is about to enter the Chicago market. Intended as a carbohydrate for supplementing milk in infant feeding, this product of Corn Products Refining Co., New York, consists of dextrins (53 per cent), maltose (26 per cent) and dextrose (16 per cent). Dextrin does not readily ferment and, unlike starch, readily digests in the infant's stomach.

In manufacturing the powdered Karo, purified cornstarch, processed to remove hulls, oils and proteins, is converted into dextrins, maltose and dextrose through the influence of high temperatures at a suitable hydrogen-ion concentration. The water-clear filtrate is concentrated in a partial vacuum and then spray-dried by a process which prevents scorching, caramelization and decomposition.

The finished white powder is packaged in enameled-lined tins which are double-covered by a friction insert top and a slip-over lid.

Strained Apple Sauce

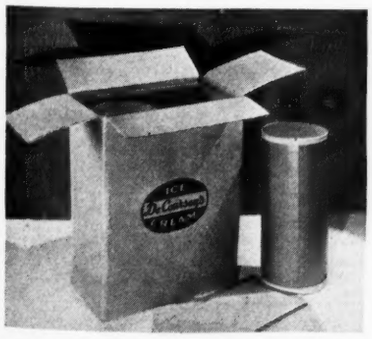
Apple sauce of fine texture and high natural vitamin and mineral values is now being canned by Beech-Nut Packing Co., Canajoharie, N. Y. The sauce is made of Spitzenburg and Red Spy apples, which are thoroughly washed to remove spray residues, then quartered, cored and trimmed of the stem and blossom ends. This raw material goes into a glass-lined vacuum kettle, where it cooks in its own steam for 50 minutes. It is then strained, processed for 30 minutes at 100 deg. C., examined for lead and arsenic, and packed. The finished product contains 12.9 per cent total solids.

Dried Milk and Peanuts

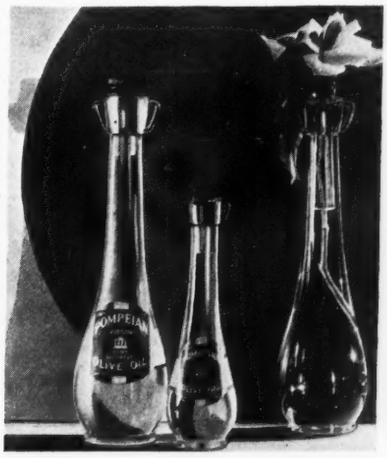
Lactonut, a spread developed by Nestlé's Milk Products, Inc., New York, contains spray-dried milk, butter fat, milk sugar, peanuts and citrate of iron. This mixture is ground to a paste and sealed in an atmosphere of nitrogen. Four ounces of the Lactonut is equivalent to a pint of modified (3 per cent) milk. Its analysis shows 37.2 per cent fat, 33.1 per cent carbohydrates (other than crude), and 23.9 per cent protein. Iron content amounts to 0.004 per cent.

Prunes and Lemon Juice

Strained prunes with enough lemon juice added to give 0.5 per cent citric acid are now being produced in Pittsburgh. Conceived by H. J. Heinz Co., the product is processed so as to retain in high degree the natural mineral content, and it is strong in vitamin G. The formula calls for dried prunes, these being cooked in closed kettles and then automatically pitted. The pulp, with the lemon juice added, goes through sieves in an atmosphere of steam, after which a vacuum removes the air. Vacuum packing in lacquer-lined cans and processing completes the product. The prunes contain 31 per cent total solids, 27.5 per cent of carbohydrates and 21 per cent of reducing sugars as invert sugar, as well as quantities of calcium, phosphorus, iron, copper and other elements.



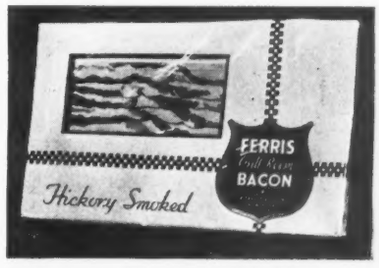
Ten gallons of ice cream in a box, minus the weight and messiness that go with the old-fashioned iced wooden tub, is a service offered Kansas Citians by De Coursey. Solid CO_2 is reported to keep the ice cream in good condition up to 24 hours in this triple-walled carton of Hinde & Dauch.



"Something exciting" in an olive-oil package was the goal of Pompeian Olive Oil Corp., Baltimore, when it created this container. The goal would appear to have been attained.

A jar that would stand out distinctively in a strongly competitive field was demanded by Francis H. Leggett & Co., New York, for its Premier mustard. It's an Owens-Illinois container.

The Thrifty Six box of National Brewing Co., Baltimore, cultivates the "cash and carry" market, being easy for the consumer to carry home and a convenient retainer for returns. Moreover, it fits the production line and is inexpensive. The box is by Hinde & Dauch Paper Co.



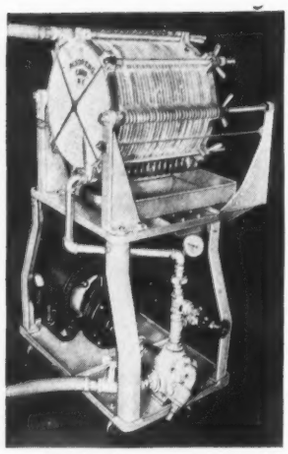
Bacon cannot be bruised easily in this carton adopted by F. A. Ferris & Co., Inc., New York, and the transparent cellulose wrapping gives protection against contamination. At the same time the package is attractive and employs to advantage the natural eye-appeal of the product.

Enertone, a health food beverage, has been developed by Heyman Process Corp., New York. Rich in calcium phosphate, diastase and vitamin B, the product is a malt base to which calcium phosphate has been added. A vacuum process granulates the malt.

NEW • EQUIPMENT • FOR

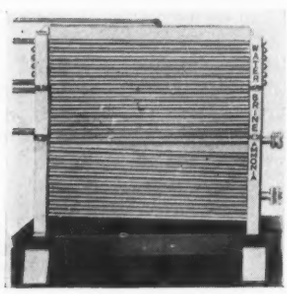
Milk Can Checks Growth of Bacteria

Prevention in milk or cream of all absorbed and self-generated odors save that of lactic acid is said to result from the use of the Chalfant can, developed by Creamery Package Manufacturing Co., 1243 West Washington Blvd., Chicago, Ill. The container retards the growth of proteolytic (putrifying) bacteria by allowing ammoniacal gases to escape through a vent in the cover. Thus, the carbon dioxide and other preservative gases check the growth of putrifying bacteria and permit the lactic-acid groups to grow unmolested. The vented cover fits standard milk cans, measuring 6¾ or 7¼ in.; it costs little more than standard types. The Chalfant may be utilized for shipping or storing milk, sweet or sour cream, ice cream mix, cottage or cream cheese, and evaporated milk.



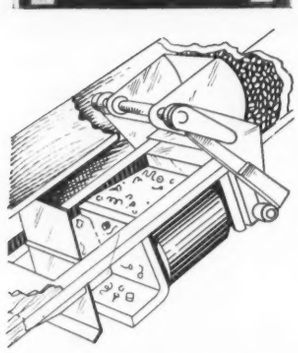
Disk Filter

Easy replacement of filtering disks and automatic operation make for efficiency of the "Hy-Speed" ultra-fine disk filters manufactured by Alsop Engineering Corp., 39 West 60th St., New York, N. Y. Thus, from two to 100 disks can be used in the filter with equally satisfactory results, it is reported. When the disks, made of asbestos by a special process, become clogged, they can be lifted out merely by loosening the large wing nuts, and new ones inserted. The standard disks are 13⅜ and 16 in. in diameter; however, various types of disks are available, depending on the liquid to be filtered and the speed required. Oil-less bearings in the stainless steel and bronze pump prevent contamination of the filtered liquid.



Three-Stage Cooler

A wort cooler now offered by Carbondale Machine Co., Carbondale, Pa., is said by its manufacturer to reduce refrigerating-machine capacity requirements about 25 per cent by the utilization of three-stage cooling mediums. Water is employed in the top section of the cooler to absorb a large percentage of the wort's latent heat. Refrigerated brine in the second stage reduces the temperature of the wort almost to that of the brine, and ammonia produces by direct expansion the required final temperature. The colder the water, the less areas in the brine and ammonia stages needed. In all three stages, the "counterflow principle" is employed, the cold mediums flowing upward in the piping against the down-flowing wort.

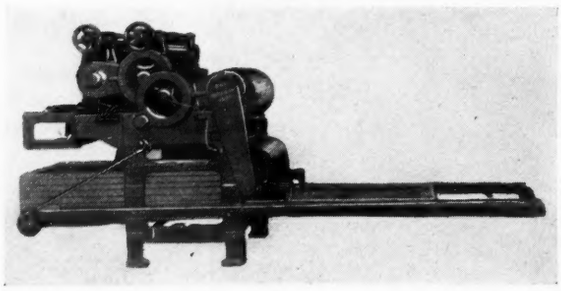


Magnetic Feed Gate

To make its magnetic separators entirely automatic, Magnetic Manufacturing Co., Milwaukee, Wis., has introduced a magnetically operated feed gate. This gate regulates the flow of grain over the magnet and starts and stops the flow when the separator is switched on and off. The gate is shaped so as to cut into the flow of grain, its weight providing the actuating force.

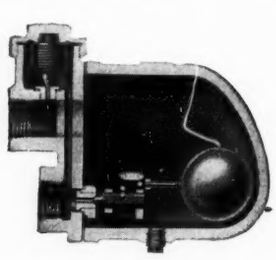
Acidproof Pump

By lining its centrifugal pumps with stoneware which resists the effects of acids, alkalis and corrosive chemicals, United States Stoneware Co., Akron, Ohio, has guarded against contamination or discoloration of the product handled. In addition, corrosion-resisting alloys are used for all metal parts that may be injured by fumes of highly volatile liquids. The stoneware fits inside a cast-iron casing, cast in two pieces so that the stoneware may be removed without disturbing the lower half of the casing. All stoneware parts are clamped in place, and therefore are easily and quickly replaced. The two types supplied, 520 and 520-N, have a maximum speed of 1,750 r.p.m. and maximum capacity of 475 g.p.m.



Float-Thermostatic Steam Trap

An automatic air bypass which keeps the trap vented at all times so that it will not become airbound is a feature of the combination float-thermostatic trap, Type FTO-H, now offered by Sarco Co., 183 Madison Ave., New York, N. Y. The



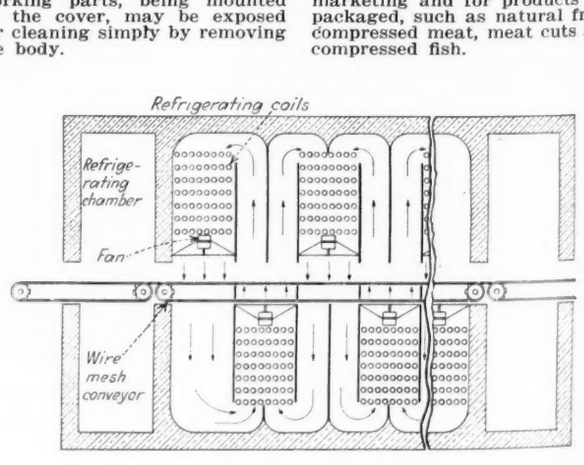
bypass consists of a flexible metal bellows to which a valve head is attached. It is partly filled with volatile fluid and is normally contracted, holding the valve open to let the air escape. As soon as steam reaches the bellows, it expands, closing the valve tightly. The bypass is arranged on the down-board side of the trap, so that the thermostat is not exposed to the full steam pressure. The trap, which carries working pressure up to 200 lb. per square inch, may be supported on the piping; all working parts, being mounted on the cover, may be exposed for cleaning simply by removing the body.

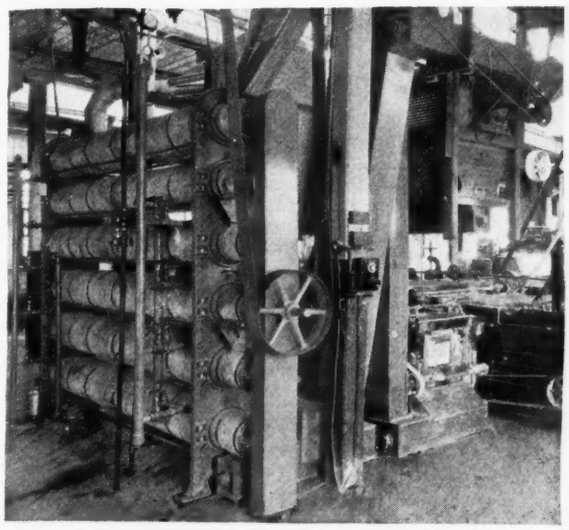
High-Speed Noodle Length Cutter

Production up to 1,200 lb. of noodles per hour may be achieved with the high-speed cutter Type NA-3, developed by Clermont Machine Co., 268 Wallabout St., Brooklyn, N. Y. Built on the general lines of earlier types of its line, the improved machine is equipped with a helical rotary knife instead of the standard rotary length cutter. In view of the increased speed, a higher gear ratio and improved bearings are used. Driven by a 7½-h.p. motor, the machine without the conveyor belt requires about 30 sq.ft. of floor space. It may be equipped with either single or double calibrating rollers and with various attachments, including a belt conveyor, an empty tray stack feed, an automatic spreader and a blower with pipe.

Air Bath Hardens Frozen Foods

To harden quickly food products such as ice cream, which have been frozen or partly frozen, a refrigerating apparatus has been developed by Equity Construction Co., Inc., 25 West 43d St., New York, N. Y. The basic purpose of the system is to give the product a bath of cold air both from the bottom and the top, made possible by the staggered fans which draw air over banks of cooling coils and direct it against the product. The cold air passes through the open-work conveyor, and baffles direct it back to the coils. The freezing chambers are vaned to insure positive impact of the cold air on the product. The apparatus, although intended particularly for hardening packaged products, is also meant for hardening molded products to be removed from the molds before marketing and for products not packaged, such as natural fruit, compressed meat, meat cuts and compressed fish.





Conditioning System For Starch

To condition starch in candy factories, whether working with a mogul or handling it in continuous flow line, Wolf Co., Chambersburg, Pa., offers a system for use in cleaning, drying and regulating temperatures required for different types of candies. The system handles all the starch from the mogul, cleaning it through a 60-mesh screen and conveying it through a series of six superimposed cylindrical dryers and conditioners. The starch may be heated by steam applied to two, four or six units; it may be cooled by cold water in the lower four. By using a conveyor system, with one motor driving the whole set through a clutch, up to 8,000 lb. of starch per hour may be conditioned.

The Manufacturers ••Offer••

Handbook—Practical information on Link-Belt machinery for the mechanical conveying and preparation of materials and the transmission of power. Link-Belt Co., 910 South Michigan Ave., Chicago, Ill. General catalog 600, 1024 pp.; imitation limp leather. Includes entire line of products from "accessories" to "wrenches." Many engineering and dimensional data and many line drawings and graphs are valuable supplements to the discussions of the various items. A pictorial section of 42 pages, tables of weights and measures, and a general index prove useful for reference.

Air Conditioners — Coolers, heaters and systems. Niagara Blower Co., 6 East 45th St., New York, N. Y. Loose-leaf bulletins Nos. 42-49; profusely illustrated.

Stainless Steel—"Enduro" 18-8. Republic Steel Corp., Youngstown, Ohio. Booklet, 15 pp.; well printed and illustrated. Includes tabulated laboratory corrosion data.

Fumigation—By the Guardite process. The Guardite Corp., 37 West Van Buren St., Chicago, Ill. Bulletin No. 28, 28 pp.; well illustrated. Includes information on insects commonly infesting food products.

Compressors—Larger sizes of the inclosed type. Frick Co., Waynesboro, Pa. Bulletin No. 221-E; illustrated folder.

Acid-proofing—"Porox" linings and cement for old and new processing equipment. Patterson Foundry & Machine Co., East Liverpool, Ohio. Well illustrated folder.

Seal—The Anchor "D" closure. Anchor Cap & Closure Corp., Long Island City, N. Y. Pictorial folder.

Refrigerating Unit—Model No. 4-34W, for ammonia. York Ice Machinery Corp., York, Pa. Illustrated leaflet.

Liner—Vinylite, a synthetic resin. Phoenix Metal Cap Co., 2444 West 16th St., Chicago, Ill. Pamphlet, 7 pp.

Truck Bodies—Rear units and cabs. Hercules Products, Inc., Evansville, Ind. Booklet, 15 pp.; well illustrated.

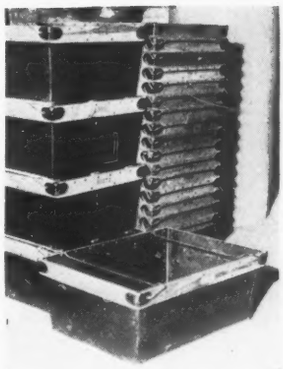
Closures—An even dozen types. Armstrong Corp & Insulation Co., Lancaster, Pa. Booklet, 14 pp.; well illustrated.

Motors—Direct-current, Type RD. Wagner Electric Corp., 6400 Plymouth Ave., St. Louis, Mo. Bulletin 167, Part 8; 4 pp.; well illustrated.

Power Transmission — From electric motor to driven machine by belting and other means. American Leather Belting Association, 41 Park Row, New York, N. Y. Booklet, 226 pp.; illustrated with many charts and diagrams. Comprises 50 reports on "design, maintenance, trouble elimination, comparative production and comparative costs, under a wide range of conditions and applications." Includes a helpful index.

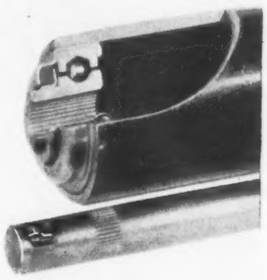
Steels—Stainless and heat-resisting alloy, by United States Steel Corp., and air conditioning equipment, by York Ice Machinery Corp., as discussed in "The Burlington Zephyr." Edward G. Budd Manufacturing Co., Philadelphia, Pa. Booklet, 18 pp.; very well illustrated.

Nesting and Stacking Bread Crate



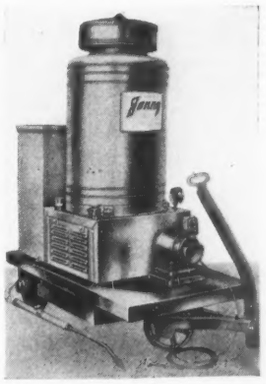
A bread crate which is said to be 75 per cent lighter and to have 60 per cent greater nesting ability than a wooden box of equal size has been announced by Detroit Nesting-Stacking Box Co., 1480 Penobscot Bldg., Detroit, Mich. The crate, made of vulcanized "trunk" fiber, weighs less than 8 lb. and carries a loaf weight of about 28 lb. The stacking rods are of spring steel and are locked into the steel corners of the box to prevent possible loss; tests show they will hold a weight of about 200 lb. The standard crate is 27¼ in. long, 19 in. wide and 10½ in. deep at the top, and tapers down to a 25-in. length and a 17-in. width at the bottom. Besides eliminating splinter and sliver hazards, the nesting and stacking box is readily repaired and is moisture-proof.

Roller Conveyor



By locking to the axle the inner ball race of the bearings used in its roller conveyors, Mathews Conveyor Co., Ellwood City, Pa., eliminates the possibility of wear between the bearing and axle. By keying the axle to the conveyor frame, the designers have also removed the opportunity for wear between the axle and frame. Teeth inside of the inner ball race and on the axle are meshed, forming a positive "gearlock," while the roller axle is held stationary in the frame by means of an upset key fitting into a corresponding slot in the frame rail. The feature described has been incorporated in rollers with load ratings from 150 to 8,000 lb. per roller. A labyrinth seal prevents dust, grit and other foreign matter from working into the bearings.

Spray Cleaner With Nozzle Control



Nozzle control, giving the operator full regulation of all machine functions and permitting continuous automatic operation, is provided in the model "D" Hypressure Jenny Spray cleaning unit announced by Homestead Valve Manufacturing Co., Coraopolis, Pa. The pumps of the new model are motor-driven, operating on lighting current, and there is an oil burner that is ignited automatically by electric spark. The unit is entirely self-contained. From the operating standpoint, the outstanding developments are the nozzle control and a saturation selector. The latter provides any degree of vapor saturation from a heavy cutting spray to a light misty one. The saturation control is independent of the pressure, which itself is adjustable between 50 and 175 lb. per square inch.

Regulates Tightness Of Cap Seal

Adjustment of the twisting force to insure a satisfactory seal and yet permit the user to open the package is possible with the manually operated screw capping machine manufactured by Herndon Corp., 227 California St., Newton, Mass. An electric motor drives a flexible drive shaft, inclosed for protection in a flexible tube with a handle on the end. This drive shaft is threaded to receive a chuck fitting the particular size of cap being used. The inside of the chuck is a taper fit for the outside of the cap, made so that the cap will not seat in the bottom of the chuck; its surface is smooth enough not to mar painted metal or plastic caps. When the cap has been placed on the container, a downward motion of the chuck turns the cap until the clutch begins to slip, stopping the chuck's rotation. The suspension of the machine eliminates the need for bench room and allows it to be used over a wide area. The spring support reduces the strain on the shaft and holds the chuck up out of the way when idle.

Labor Demands, and Gets, Wage Concessions

(Concluded from page 281)

Good news mingled with bad in the Columbia River salmon-canning industry. The strike of fishermen and cannery workers was settled, albeit not in favor of the canners, but longshoremen then got up in arms. And this is something beyond the power of the canners to settle.

The baking industry had more than its share of trouble with laborers. In Akron, 300 voted a strike and got a 10 per cent wage increase, shorter working hours and an arbitration plan. Another 300, employees of Val Decker Packing Co., Piqua, Ohio, obtained a 12½-per cent increase, and 180 bakers and drivers of Omar Baking Co., Columbus, walked out in a protest for more pay and less work. In Detroit, National Labor Board stepped in to arbitrate a dispute between Gordon Baking Co. and the teamsters', chauffeurs' and helpers' union, while in Reading, Pa., it decided in the Quinlan Pretzel Co. case that the company in obligating itself to dismiss employees for non-payment of union dues does not violate Sec. 7 (a) of the National Industrial Recovery Act.

In St. Louis, where labor seems to be quite adamant, a milk-wagon-drivers' union authorized a strike to effect restoration of an 8 per cent reduction in wages made two years ago. But organized labor got tangled up in the fight of a teamsters' union to prevent other unions from delivering beer for breweries, and Circuit Judge Green made permanent an injunction to prevent interference by the former with the work of the latter.

Quaker Oats Guarantees Pay for Laborers

Another food company progressive in its dealings with labor has announced a guaranteed work plan. The Quaker Oats Co. recently put into effect at its plants in Akron, Cedar Rapids and St. Joseph, a system of compensation similar to that adopted not long ago by William Wrigley, Jr., Co.

Under the Quaker Oats plan all employees working on an hourly or piecework wage basis are entitled to the benefits if they have served not less than six months within the past twelve. To these workers the company guarantees, while they are on the payroll, 140 hours work in each month. This is more than 80 per cent of the present base time of 40 hours per week.

When removed from the payroll, employees will be paid for one-half of their guaranteed time, or 70 hours per month, at their full hourly or base rate for such total periods within any twelve months' continuous employment as their service entitles them. The periods of pay are two, three, four, and six months respectively for employees with a total service credit of six months to one year, one to two years, two to three years, and three years or longer. If an employee is absent for personal reasons, the guaranteed time is reduced by the number of hours of such absence. When the worker is not recalled within six months, no further payment will be made.

Buyers Name Preferences

From a survey covering 37,536 of its readers in small towns, *Woman's World* has obtained some interesting information on consumer preferences for bran, cereals, cheese, condensed milk and junket desserts. The study also reveals to what uses these products are put. Of 22,433 women who said they bought bran, 11,893 expressed preference for Kellogg's; 7,154 for Post's; and 1,535 for Pillsbury's. As to what they used bran for, 8,546 listed cereal; 5,848, baking; 2,844, muffins; 2,362, laxative; and 1,013, breakfast.

Asked the favorite cold cereal of their family, 8,674 of the 37,563 women replying mentioned Corn Flakes; 4,050, Post Toasties; 3,441, Shredded Wheat; 3,190, bran; 2,903, Grape Nuts; and 2,868 Wheaties. *Woman's World* asked who insisted upon cold cereals, and in 6,596 families the answer was "everybody." Of the other replies, 6,138 named the husband; 5,100, children; 3,695, son; 2,382, daughter; 2,168, father; 1,680, the housewife; and 611, baby.

Their favorite cheese was listed by 37,563 women, Kraft scoring 13,115. Next highest was Swift with 886. Of the cheese buyers, 17,045 purchase the packaged product; 19,136 buy in bulk; and 6,273, in loaf. Of the 12 most popular uses for cheese, sandwiches ranked first with a score of 13,006. Then came macaroni with 4,537; plain, with 2,460; salads, 2,205; and cooking, 1,917.

Of the condensed milks, Eagle Brand rated 6,133; Carnation, 2,105; Pet, 2,091, these being the outstanding choices. In answering how they used condensed milk, 3,260 mentioned coffee; 2,725, cooking; and 2,137, candy.

Asked which type of junket desserts they preferred, 8,844 women specified tablets, and 7,039, flavored. Of the women circularized, 38.95 per cent make junket desserts.

Abstracts of Current Literature

(Concluded from page 272)

aromatizing effect, as does the new compound. Acetylmethylcarbinol and biacetyl are both being produced by a carefully controlled fermentation process, developed through long and painstaking research. Samples can be obtained from the producer, the Naamlooze Vennootschap Nederlandsche Gist- en Spiritusfabriek, in Delft, Holland.

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LECITHIN FROM SOY BEANS. A. N. Lebedev and V. S. Gryuner. *Papers from the Central Research Institute for Food Chemistry (USSR),* Vol. 4, pp. 118-135; 1933.

Central Research Institute for Food Chemistry, with laboratories in Moscow and Leningrad, has made a systematic effort to improve the recovery of lecithin from soy beans. On the basis of laboratory trials (not yet confirmed by factory runs) the best method for recovery of lecithin is considered to be preliminary fat removal by extraction with a light petroleum distillate—gasoline—followed by a thorough extraction with gasoline containing 15 per cent of ethyl alcohol. After distilling off the solvent, the lecithin extract is purified by adding alcohol and distilling again. When this product was compounded with 20 to 40 per cent of a solid fat such as cocoa butter it gave a lecithin preparation considered equal to the American product; for example, as little as 0.25 per cent added to chocolate gave a marked viscosity reduction. Commercial production of lecithin by the new method is considered to be feasible.

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CHUFA NUTS. M. G. Ruitikov. *Papers from the Central Research Institute for Food Chemistry (USSR),* Vol. 4, pp. 136-144; 1933.

Chufa nuts, also known as earth almonds, have a particular interest because they are unusually rich in oil, starch, and water-soluble carbohydrates; most plant products are relatively richer in one or two of these components at the expense of the others. Chufa-nut oil has a very pleasing flavor and should be readily marketable. The nuts, whole or broken, could be used to excellent advantage in many foods and confections; even the cake from expressing the oil is useful in food products. The starch and the soluble carbohydrates in the nuts are added advantages, in that they help the nuts to blend readily in agreeable combinations with other materials. There is already considerable cultivation of chufa nuts in Italy, Spain, parts of Asia and in some regions in America.